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CHRONIC HEPATITIS IN THE MEDITERRANEAN THEATER

A NEW CLINICAL SYNDROME

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In a previous communication we have reported our observations on acute infectious hepatitis in the Mediterranean theater.[1] During the course of these studies it became apparent that certain patients failed to recover promptly, exhibiting symptoms and findings indicating persistent hepatic disease for prolonged periods of time with a tendency toward exacerbations and remissions. These cases present a sufficiently distinctive and uniform clinical picture to justify their consideration as a separate group or syndrome, which we have called chronic hepatitis. By the use of the term "chronic" we refer only to duration without implication regarding the nature of the pathologic process or the eventual prognosis. Although the existence of this condition has been recognized by others,[2] we believe that this is the first detailed clinical description based on adequate material.

Because of the large number of persons who have had infectious hepatitis during the last few years, the interpretation of residual symptoms and findings has become an important problem. It is often necessary to determine whether an organic lesion exists in such cases and, if so, whether further hospitalization and treatment will be beneficial. It is not possible to answer all of these questions with finality at the present time, but we believe that sufficient data are available to indicate a practical clinical approach to the problem.

It should further be pointed out that the term "syndrome" has been used advisedly, since it is probable that other etiologic types of hepatitis may present a similar clinical picture. Certain heretofore vague conditions common to civilian practice may well be clarified by these observations.

This work was made possible by the Surgeon's Office, Mediterranean Theater of Operations, and was greatly aided by many medical officers, nurses, enlisted personnel and other military personnel.

1. Barker, M. H.; Capps, R. B., and Allen, F. W.: Acute Infectious Hepatitis in the Mediterranean Theater, J. A. M. A. **128**:997 (Aug. 4) 1945.

2. Polack, E.: Chronic Hepatitis in Young Persons With or Without Intermittent Jaundice, Acta med. Scandinav. **93**: 614, 1938. Caravati, C. M.: Posthepatitis Syndrome, South M. J. **37**: 251 (May) 1944. Findlay, G. M.; Martin, N. H., and Mitchell, J. B.: Hepatitis After Yellow Fever Inoculation, Lancet **2**: 340 (Sept. 9) 1944. Wilensky, A. O.: The Interrelationship of Undernutrition, Fatigue and Latent Liver Disease in the Industrial Worker, New York State J. Med. **45**: 1447 (July 1) 1945.

MATERIAL AND METHODS

This study is based on 76 patients obtained from among the unselected group of 431 cases of hepatitis previously described.[1] Many other examples of this condition were seen only in consultation. Although the clinical picture served as the primary basis for selection of cases, it was obviously necessary for statistical purposes to employ some arbitrary definition. Since the duration of the acute disease is both long and variable, the criticism must be avoided that we are simply dealing with the expected variants. Consequently we have chosen only those patients with evidence of active hepatitis four months or more after the onset (table 1). This is equivalent to a minimal period of five and one-half months from onset to recovery. An additional 79 patients were observed in the group of 431 who presented a similar picture but fell short of the foregoing criteria. Most of these were admitted in the acute stage, failed to recover in three months and so were evacuated to the United States. Many undoubtedly represent the same condition.

TABLE 1.—*Duration of Active Infectious Hepatitis in 76 Cases of the Chronic or Persistent Type*

	Months										
	4	5	6	7	8	9	10/12	13/24	25/36	Total Cases	% of Total
Number of cases											
Recoved.....	7	5	4	3	0	4	5	4	1	33	43.5
Unrecovered....	2	9	7	4	9	6	3	3	0	43	56.5
Total cases.....	9	14	11	7	9	10	8	7	1	76	

The final outcome in the unrecovered cases is not known.

The methods employed were the same as in our previous report.[1] Normal figures for the 5 mg. per kilogram sulfobromophthalein dye test were established during our Fort Custer, Michigan, study.[1] Fifty-five out of 56 normal soldiers who were given this test showed zero dye retention in one hour, and 1 man had 2 per cent retention. In order to allow for technical errors we have taken 3 per cent or more retention in one hour as abnormal. This is a conservative figure as judged by the literature.[3]

Microscopic observations on liver tissue obtained at biopsy as well as bacteriologic and virus studies were made by others on some of these patients. These results, when completed, will be published separately.

ETIOLOGY AND INCIDENCE

All of our cases gave a history consistent with acute infectious hepatitis either with or without jaundice at the onset of the disease. Evidence of activity of the hepatitis was always present, although sometimes minimal, during the interval between the onset and the

3. Mateer, J. G.: Blatz, J. I.; Marion, D. F., and MacMillan, J. M.: Liver Function Tests, J. A. M. A. **121**: 723 (March 6) 1943. Soffer, L. J.: Present Day Status of Liver Function Tests, Medicine **14**: 185 (May) 1935.

period of observation. This period was never less than three months. Jaundice occurred or recurred in 29 cases during the study period (table 2). Finally, all cases showed a positive exercise tolerance test,[1] indicating the existence of a potential recurrent acute hepatitis picture. In view of these facts it is only reasonable to suppose that a persistent virus infection is present, although there may also be additional etiologic factors of importance. As yet the bacteriologic studies have not been made to determine the presence of virus in the blood, liver or excreta.

TABLE 2.—*Prognostic Significance of a History of Jaundice During the Course of Chronic Hepatitis Prior to Admission and Jaundice at the Time of Observation*

Earlier in Course	Period of Observation	Number of Cases	Total Recovered	Per Cent Recovered
Jaundice	Jaundice	20	6	30
Jaundice	No jaundice	21	8	38
No jaundice	Jaundice	9	4	44
No jaundice	No jaundice	26	15	58

It has been impossible to ascertain accurately the true incidence of this condition. It is probably quite variable. The great frequency (18 per cent) observed in our group was in part due to the poor nutritional condition of many soldiers at time of onset resulting from prolonged combat and in part to inadequate treatment of the acute disease. This figure, of course, is only for a particular group of hospital patients and does not indicate the number of acute cases in which the chronic form of the disease developed. During the last year the improvement of these factors has been associated with a reduction in incidence. The fact remains, however, that chronic hepatitis is much more common than generally suspected. It is too often unrecognized.

CLINICAL PICTURE

The clinical picture to be described is applicable to all phases of the chronic disease except a severe icteric relapse. Here the picture is the same as that of acute hepatitis except for severity, duration and prognosis.

History.—There is usually a history of an acute febrile illness consistent with acute hepatitis at the onset of symptoms. Occasionally the onset is insidious, as it may be in 10 to 15 per cent of acute cases. Following a period of illness, partial recovery occurs. Symptoms of the chronic disease then develop and persist with exacerbations and remissions. The patient may seek the doctor because of an exacerbation or simply because of persistent symptoms.

Symptoms.—The outstanding symptoms are lassitude, fatigue and mental depression of sufficient severity to be disabling in variable degrees. These are often most evident in the morning on awakening. The patient feels that he is "tired out" or wonders if "he isn't just neurotic." By forcing himself he is able to get through the day's work, but his mental and physical efficiency is low. Mental confusion and symptoms resembling an anxiety state are sometimes seen. True muscular weakness is unusual.

Of more diagnostic importance are those symptoms arising in the right upper quadrant, right lower chest and right lumbar region of soreness, aching, heaviness, fulness and sometimes actual pain. These symptoms are specifically aggravated by exertion and by jolting activity such as a rough automobile ride. Although this effect may be prompt in appearing, it characteristically persists for one or more days. Deep breathing may produce a sharp, deep, poorly localized pain in the right side of the chest, and lying on the right side is often uncomfortable.

Low grade fever is occasionally present but unusual and suggests intercurrent infection. During the initial phase of an acute relapse, fever is frequently observed. Other common symptoms of chronic hepatitis are anorexia, dyspepsia, flatulence, intestinal cramps, intermittent mild diarrhea and headaches. Weight loss is common and occasionally severe, but many patients are well nourished. In a few instances attacks of severe generalized itching and formication have been seen, induced by heat and emotional states and associated with "goose pimples" and sometimes miliary urticaria.

Physical Findings.—The liver is always enlarged and tender, but exercise may be necessary to make this finding manifest. Tenderness in the right costovertebral angle [1] and pain on fist percussion over the liver are usually present. There is often a latent period of about five seconds before this pain appears or reaches its maximum, which is a helpful differential point. The spleen is occasionally palpable and may be tender. Low, right sided, deep cervical adenopathy is often found during a relapse. The patient may or may not be jaundiced.

Laboratory Findings.—As would be expected, laboratory findings depend on the type of case and degree of activity of the hepatitis. In a severe icteric relapse the findings are the same as in the acute disease.[1] In other cases the laboratory is of less assistance, and often the diagnosis must be made on purely clinical grounds.

The sulfobromophthalein dye retention is abnormally elevated in 66 per cent of cases and has proved to be the most valuable test with which we have had experience (table 3). A normal test, however, does not rule out the diagnosis, although it does suggest that the liver damage is minimal. Retention of more than 9 per cent in one hour (or about 16 per cent in forty-five minutes) has almost always been associated with active hepatitis. A retention of 3 to 9 per cent in one hour means liver dysfunction but does not indicate the nature or whether the hepatitis is active or inactive. Serial tests, of course, are more informative than single determinations.

Bilirubinemia, a prompt direct qualitative van den Bergh reaction and bilirubinuria are significant when present but may be repeatedly absent. The erythrocyte sedimentation rate is often moderately elevated, but high readings suggest intercurrent infection. The blood picture is variable, although large atypical lymphocytes are often found. Anemia is unusual.

We have also had extensive experience with the Hanger test, serum alkaline phosphatase, serum globulin (table 3) and bilirubin clearance test. These procedures are often of value but are not consistently positive. The

TABLE 3.—*Significant Laboratory Findings in 76 Cases of Active Chronic Hepatitis*

	Nonicteric		Icteric		% of Total Abnormal
	Cases Tested	% Abnormal	Cases Tested	% Abnormal	
Sulfobromophthalein	44	64	26	69	66
Hanger	47	47	29	76	58
Serum phosphatase	40	20	29	41	29
Serum globulin	22	36	15	73	51

Patients are separated according to the presence of icterus during the period of observation. No sulfobromophthalein tests were done in the presence of clinical jaundice.

additional use of serum amylase, serum albumin, colloidal gold and oral hippuric acid tests have not proved helpful. Results of urobilinogen determinations employing the usual methods have been too variable to be of aid. We have had insufficient experience with quantitative methods [1] to draw conclusions, but the preliminary results are encouraging.

An observation of practical interest is that the Graham-Cole test may reveal a dim or absent gallbladder shadow even when no jaundice is present. As the activity of the hepatitis subsides the gallbladder shadow gradually reappears or increases in density, as shown by repeated tests. There is also evidence obtained by Capt. Frank Parker Jr., M. C., that active nonicteric hepatitis may be associated with night blindness.

COURSE AND PROGNOSIS

Chronic hepatitis is characterized by a protracted course and a tendency to relapse, as shown in tables 1 and 4. How long active hepatitis may persist is not known, but our unrecovered patients still had active disease when evacuated to the United States after three months of hospitalization. Eight patients were active for more than one year and 42 for more than six months.

TABLE 4.—*Prognostic Significance of the Number of Distinct Exacerbations Prior to the Period of Observation, Including Those With and Without Jaundice*

Number of Exacerbations	Total Cases	Postvaccinal Hepatitis	Total Recovered	Per Cent Recovered
1	53	6	24	45
2	17	5	7	41
3	5	1	1	20
4	1	1	1	100

Column 2 shows the number of cases in each group with an additional history of postvaccinal hepatitis.

TABLE 5.—*Rate of Recovery and Duration of Hospitalization in Chronic Infectious Hepatitis*

Chronic Hepatitis	Total Cases	Per Cent of Total Discharged Recovered, Days After Admission				Recovered, Under Observation		Average Hospital Days, Recovered Cases
		42	56	70	84	No. of Cases	Per Cent	
Group N	46	4	9	15	22	15	33	72
Group R	30	13	40	50	53	18	60	54

Group N received the usual prewar therapy, while group R was treated by improved methods. Unrecovered cases were treated for three months before evacuation.

The course is variable, the degree of activity remaining fairly constant for months in some cases and fluctuating in others. Thus a given patient may feel fairly well as long as he performs only light duty, but increased exertion or an intercurrent infection may result in a reappearance or accentuation of symptoms. Inadequate treatment perpetuates the disease, although some patients gradually recover spontaneously over a period of months.

One of the most characteristic features of this syndrome is the prolonged treatment necessary to effect recovery. Thus, as shown in table 5, even with adequate therapy, 40 per cent of patients will still have active disease after three months, whereas in acute hepatitis the figure is 10 per cent or less. The duration of an acute icteric relapse is usually much longer than that of an acute primary attack of the same severity.[4] Furthermore, in patients at bed rest or on minimal exercise subclinical activity of the hepatitis remains present for weeks following apparent recovery. This can be demonstrated by employing the exercise tolerance test or its equivalent. Failure to appreciate this phenomenon will lead to erroneous decisions.

The immediate prognosis is good except in the presence of a severe relapse. Here one must take a more serious attitude than in an apparently comparable primary acute attack. The prognosis regarding clinical recovery and the time that will be required is always uncertain and difficult. Factors to be considered are age, duration of the disease (table 1), the number of relapses (table 4), the severity of the relapses as indicated by jaundice (table 2), the presence of removable precipitating factors as indicated in the next section, and the response to treatment. Although the appearance of jaundice is usually an unfavorable sign, sometimes a sharp icteric relapse may be followed by unexpectedly prompt recovery as if an adequate immunity had been produced. Failure to gain weight in definitely underweight patients is almost always associated with persistence of activity of the hepatitis. The importance of a past history of prewar "catarrhal jaundice," postvaccinal hepatitis or toxic hepatitis is difficult to determine. It is our clinical impression, however, that previous attacks of hepatitis frequently lead to a poorer prognosis.

Regarding the eventual prognosis, little is known. A few patients have been observed with ascites and spider nevi. Some of these improve and some develop a fatal liver failure. Cirrhosis is probably rare. However, it should be pointed out that on the basis of experimental evidence [5] chronic or repeated liver trauma is more likely to result in permanent liver damage than a single severe insult. There is also considerable evidence in the literature that following infectious forms of hepatitis a large percentage of patients have a disturbance in bilirubin metabolism or excretion lasting for many years and probably of a permanent nature.[6] Whether this finding indicates a benign dysfunction or whether it is usually associated with a more general disturbance of liver function is a matter of dispute. We can only say that clinical recovery is reasonably complete in the majority of our cases.

FACTORS ASSOCIATED WITH CHRONICITY AND RELAPSE

Exercise and Diet.—It has already been shown [1] that inadequate rest and a poor diet during the primary acute attack are important factors in the development of the persistent type of the disease. Seventy-five per cent of our chronic cases had less than four weeks' hospitalization in their initial acute attack and many had only ten days or none at all. It is probable that a poor nutritional status at the time the disease is contracted is an additional factor.

Infection.—Various intercurrent infections may prevent recovery from acute or chronic hepatitis or induce a relapse. This is particularly true of malaria, atypical pneumonia and dysentery. Acute tonsillitis, scarlet fever, acute pharyngitis, furunculosis and severe pyorrhea may play a similar role.

Tissue Trauma.—Traumatic wounds and surgical operations such as tonsillectomy or appendectomy are

4. Barker, Capps and Allen: Acute Infectious Hepatitis in the Mediterranean Theater,[1] chart 3, p. 1000.

5. Himsworth, H. P., and Glynn, L. E.: Toxipathic and Trophopathic Hepatitis, Lancet **1**: 457 (April 8) 1944.

6. Soffer, L. J., and Paulson, Moses: Residual Hepatic Damage in Catarrhal Jaundice as Determined by the Bilirubin Excretion Test, Arch. Int. Med. **53**: 809 (June) 1934. Kornberg, A.: Latent Liver Disease in Persons Recovered from Catarrhal Jaundice and in Otherwise Normal Medical Students as Revealed by the Bilirubin Excretion Test, J. Clin. Investigation **21**: 299, 1942. Altschule, M. D., and Gilligan, D. R.: Chronic Latent Hepatitis Following Catarrhal Jaundice, New England J. Med. **231**: 315, 1944.

likely to be followed by a relapse. Inhalation anesthetics, especially ether, are of course an additional factor of considerable importance in such cases. Trench foot is very frequently associated with hepatitis, although the mechanism is not clear.

Alcohol.—When active hepatitis is present, excessive use of alcohol will definitely cause a relapse. We have no evidence, however, that alcoholic addicts are predisposed to hepatitis.

Spontaneous Relapse.—Neefe and his associates [7] have shown that in certain cases hepatitis may tend to run a cyclic course with several spontaneous exacerbations. This may explain the periods of increased activity of the disease which occasionally occur without cause in patients under apparently constant conditions.

Effect of Menses.—Usually beginning three to five days prior to the onset of menstruation, signs of increasing activity of the hepatitis may appear. In table 6 are a series of observations in such a case. On May 26 there was again a slight increase in findings preceding

TABLE 6.—*Effect of Menses in Chronic Hepatitis Without Jaundice*

	Onset of Menses May 5 at 5 P. M.							
		May						
Determination	April 28	4	6	11	13	19	26	June 3
Sulfobromophthalein, per cent retention 30/60 minutes	12/1	15/6	—	10/4	—	8/3	6/2	6/1
Hanger test, 24 hr./48 hr.	0/±	0/±	—	±/1+	—	0/0	±/2+	0/±
Liver size, finger-breadths below costal margin	3 F	—	3 F	—	3 F	1-2 F	1-2 F	—
Liver tenderness	2+	—	4+	—	3+	1+	2+	—
Right costovertebral angle tenderness	2+	—	3+	—	3+	1+	2+	—
Symptoms	2+	—	4+	..	3+	1+	2+	—

the next menses, which occurred June 4, but the hepatitis was in a less active stage. Fluid retention associated with the menses is undoubtedly an important factor, but there is probably also an increase in activity of the hepatitis, as shown by the changes in sulfobromophthalein retention.

REPORT OF CASES

The following cases serve to demonstrate some of the foregoing points:

CASE 1.—A white medical officer aged 38 was admitted because of progressively increasing lassitude and fatigue for the previous five months. He had received yellow fever vaccine in March 1942 and developed extreme fatigue three months later with anorexia and right upper quadrant pain associated with a large and tender liver. No jaundice or dark urine was observed, but the officer was not hospitalized. Exercise was restricted, and symptomatic recovery occurred in about three weeks. In April 1943, in the Italian theater, the patient had a rather prolonged bout of atypical pneumonia. Convalescence was slow, and residual fatigue persisted. The liver was found to be somewhat enlarged at this time, but no special attention was paid to it.

About March 1, 1944 the patient developed increasing fatigue, lassitude, mental depression, right lumbar and right upper quadrant pain and deep pain in the right chest on breathing. Because of the latter symptom a chest plate was requested but was normal. There were also attacks of generalized pruritus, occasionally accompanied by miliary urticaria precipitated by heat and emotional states. Lying on the right side was uncomfortable. These symptoms became so severe that the patient consulted one of us on March 20, 1944 and the liver was found to be 6 cm. below the costal margin and very tender and was associated with tenderness in the right costovertebral angle. There was no jaundice, dark urine or anorexia, but intestinal cramps and an abnormal amount of flatus were present. A diagnosis of acute infectious hepatitis without jaundice, possibly recurrent, was made.

Against our best judgment the patient was kept in quarters and allowed to do light duty for six weeks. On March 31 the icterus index, serum phosphatase, Hanger test and hippuric acid excretion test were within normal limits. Symptomatic improvement occurred, so that by April 21 the chest pain and right upper quadrant pain had disappeared. Lassitude and fatigue were much less but still present. The liver was only 3 cm. below the costal margin and mildly tender. A sulfobromophthalein dye test showed 6 per cent retention in thirty minutes and 1 per cent in sixty minutes, and the Hanger test was negative. On May 31 symptoms were minimal; the liver edge was just palpable and not tender. No costovertebral angle tenderness was present.

Full duty was resumed in June; only minimal lassitude and fatigue were present. In July lassitude, fatigue and some right upper quadrant aching began to reappear, especially following strenuous exertion. These symptoms, associated with mental depression and symptoms of vasomotor instability, gradually increased until work was accomplished with great difficulty and with increasing inefficiency. Finally, on December 7 the patient was forced to enter the hospital because of the severity of the symptoms. Examination revealed a moderately tender liver 5 cm. below the costal margin with moderate right costovertebral angle tenderness. The qualitative and quantitative van den Bergh tests, the serum phosphatase and the Hanger tests were normal. The sulfobromophthalein excretion was 14 per cent in thirty minutes and 6 per cent in sixty minutes. The bilirubin clearance showed 16 per cent retention after three hours using a 200 mg. dose, a borderline figure, and a double oral Graham-Cole test revealed a very dim gallbladder shadow.

The patient was kept strictly in bed for four weeks and put on a high protein (250 Gm.) diet including about 2 pounds of rare steaks daily. On December 19 the liver was only 2 cm. below the costal margin and mildly tender. Symptoms were much improved. The sulfobromophthalein test showed 2 per cent retention in one hour. On Jan. 3, 1945 the dye retention was zero in one hour. After one month in bed only minimal symptoms were present. The patient stated that he hadn't felt so well for at least a year. The liver was slightly enlarged (3 cm.) but not tender. He was allowed up on minimal exercise for one month and then returned to duty.

Follow-up showed that there was mild increase in symptoms and in the physical findings during the subsequent three months following strenuous exertion, but improvement has continued and in August 1945 the patient is almost symptom free. The sulfobromophthalein test on March 20 was 1 per cent in one hour.

This case shows the prolonged course that chronic hepatitis can run. Whether the March 1944 attack was really the onset or whether it was in April 1943 we cannot say. No jaundice was ever observed. Recovery did not occur until after a two month period of hospitalization, and it is still not certain that it is complete. The correlation between the objective findings and the symptoms suggestive of a psychoneurosis is striking and indicates that the latter are on an organic basis.

CASE 2.—A white soldier aged 19 was admitted on March 2, 1944 because of fever, nausea and vomiting of four days' duration. On Nov. 11, 1943 he had a similar attack associated with "coca-cola" colored urine but no definite jaundice. He was not hospitalized. The acute symptoms subsided in about a week, but since then he had experienced pronounced lassitude, easy fatigue, anorexia and fat intolerance. He continued in combat but was able to perform his duties only with the

7. Neefe, J. R.; Stokes, J., Jr.; Reinhold, J. G., and Lukins, F. D.: Hepatitis Due to the Injection of Homologous Blood Products in Human Volunteers, J. Clin. Investigation **23**: 836 (Sept.) 1944.

greatest effort. There was no previous history of jaundice. He had not received yellow fever vaccine.

On admission the liver was very tender and enlarged 5 cm. below the costal margin. Moderate jaundice was present. The next day the icterus index reached 44, the maximum elevation. The serum globulin was 3.3 Gm. per hundred cubic centimeters, alkaline phosphatase was 4.5 Bodansky units, the Hanger test was 2+/3+ and the oral hippuric acid excretion test was 2.9 Gm. Repetition of this last test the following day after 15 Gm. of aminoacetic acid gave a result of 3.6 Gm.

One month after admission the icterus index was normal, the liver was only slightly enlarged (3 cm.) and only slightly tender, and symptoms were much improved but the sulfobromophthalein dye detention was 36 per cent in thirty minutes and 18 per cent in sixty minutes. After two months' total bed rest the liver was not definitely tender, only borderline in size (2 cm.) and symptoms were minimal, so the patient was allowed out of bed. Following thirteen days on an ambulatory status an exercise tolerance test was started. By the morning of the third day the liver had become definitely tender and had increased in size to 4 cm. below the costal margin, and tenderness had appeared in the right costovertebral angle. Lassitude, fatigue and anorexia became evident and a constant ache developed in the right upper quadrant. The sulfobromophthalein retention was 22 per cent in thirty minutes and 17 per cent in sixty minutes.

The patient was returned to bed. The aforementioned findings and symptoms remained for about ten days before beginning to subside. A check sulfobromophthalein test was 38 per cent in thirty minutes and 18 per cent in sixty minutes.

The patient was evacuated to the United States because of obvious activity of the hepatitis after three months' hospitalization.

This case demonstrates the development of the chronic state due to lack of treatment in a mild acute hepatitis. Such initial attacks are often diagnosed as an upper respiratory infection. The subsequent symptoms may be severe but not totally disabling and are frequently looked on as functional by the medical officer. Most important is the apparent clinical recovery at bed rest and the demonstration by means of the exercise tolerance test of persistent activity after more than two months of treatment. One would expect a primary acute hepatitis to have recovered by this time.

DIAGNOSIS

The diagnosis of chronic or relapsing hepatitis with jaundice is not difficult if the past history is kept in mind. Obstructive, hemolytic and spirochetal forms of jaundice and toxic hepatitis must be ruled out. This subject is well covered in the literature. Active hepatitis must not be diagnosed on the basis of low grade elevations of serum bilirubin alone (2.0 mg. per hundred cubic centimeters or under) since many patients clinically recovered from infectious hepatitis may have such findings for years.[6] If other evidence of activity is not present the exercise tolerance test must be employed.

In the absence of jaundice, diagnosis becomes more difficult, especially if the initial acute attack was also nonicteric. In the latter case the physician must be unusually cautious in making this diagnosis and the picture must be very clearcut, else patients will be unnecessarily invalided and other conditions will be missed.

A definitely enlarged and tender liver must be found and there must be an abnormal exercise tolerance test or its equivalent. If such liver findings are already present, exercise is, of course, unnecessary. There should be a history of an acute attack of hepatitis preferably within a year, with residual symptoms suggesting at least mild activity. The presence of characteristic symptoms which are aggravated by exertion or by jolting activities is important. Abnormal laboratory findings are valuable corroborative evidence, although not absolutely necessary. An elevated sulfobromophthalein retention or an increased serum bilirubin is to be especially desired. A dye retention of 5 per cent in one hour or more is desirable for diagnosis in cases that have never been icteric. This finding alone, of course, indicates only liver dysfunction and does not constitute a basis for the diagnosis of active hepatitis.

It is also necessary to consider other etiologic types of hepatitis. Acute alcoholic hepatitis, chronic brucellosis and toxic hepatitis as from carbon tetrachloride may present somewhat similar pictures especially from the laboratory point of view. The history and, in certain cases, specific tests will usually clarify the situation.

The determination of liver size and tenderness on physical examination is not easy and because of its importance warrants discussion. Percussion of the upper border is essential in order to rule out ptosis. To be certain of the location of the lower border, the actual edge should be felt. Frequently, light palpation will be more satisfactory than the usual deep variety, since the patient with a tender liver is likely to stop inspiring when the edge meets the physician's hand. When the edge is not definitely palpable, percussion is the most reliable guide. In doubtful cases a roentgenogram may be helpful. It must be remembered that the location of the normal liver edge during deep inspiration is variable and that it is often readily felt 1 cm. below the costal margin. One can be certain of moderate degrees of enlargement only when definite changes in size occur. Finally, the normal liver is somewhat tender if the edge is "flipped." Clinical judgment is necessary for proper evaluation.

The most frequently encountered conditions that have had to be differentiated from this syndrome are as follows:

Chronic Diarrhea and Irritable Bowel.—Because of the frequency of intermittent diarrhea in chronic hepatitis these conditions are readily confused. Bowel tenderness in the right upper quadrant can be distinguished from hepatic tenderness by noting that in the former case the tenderness is more pronounced during expiration, whereas in the latter case it is more pronounced during inspiration. Percussion tenderness may be present in both instances.

In uncomplicated chronic diarrhea there is ordinarily no abnormality in liver findings or in liver function tests. However, in amebiasis and possibly certain other types of chronic dysentery, liver disease may occur. Furthermore, it is not unusual to find infectious hepatitis and amebiasis in the same individual. Specific therapy should be employed and the hepatitis evaluated after the amebiasis is under control.

Duodenal Ulcer and Chronic Cholecystitis.—The not infrequent finding of an irritable duodenal bulb at x-ray examination in cases of chronic hepatitis has led to occasional confusion with duodenal ulcer. It is probable that a duodenitis is present. Because of the symptomatology and an absent or dim gallbladder shadow with the Graham-Cole test the diagnosis of chronic cholecystitis may be erroneously made. In the case of infectious hepatitis, however, this test will become negative as recovery progresses. In our experience the exercise tolerance test, liver function tests and history have usually sufficed to differentiate these conditions.

Psychoneurosis.—This is the most frequent diagnostic error. Confusion arises because of the mental depres-

sion, the superficially suggestive symptomatology and the usual psychoneurotic factor present in any prolonged illness. If objective findings are relied on, the diagnosis is not difficult and the only real problem is the extent of the functional factor if any. If active hepatitis is present, caution must be exercised in making an additional diagnosis of psychoneurosis because bed rest will frequently relieve all symptoms.

Chronic Malaria.—Untreated chronic malaria may present a picture very similar to that of chronic hepatitis. Anemia, a high erythrocyte sedimentation rate, reticulocytosis and pronounced splenomegaly are suggestive findings. Since these two conditions frequently occur together, it is necessary to employ the usual diagnostic criteria for hepatitis after specific antimalarial therapy has been completed.

MANAGEMENT

The first consideration is the establishment of the diagnosis. In this connection it should be made clear that ordinarily the patient with active chronic hepatitis who comes to see the doctor and has been on duty or at work has evident objective findings. An exercise tolerance test under such circumstances is unnecessary and undesirable and should be reserved for cases in which the diagnosis is in doubt. If active hepatitis has been established the patient should be put to bed. Lavatory privileges can be allowed except to the seriously ill, but otherwise strict rest must be enforced. The patient should be placed on a well balanced, high protein (250 Gm.), high caloric diet as in the acute disease.[1] The most desirable proteins are meat, milk, cheese and eggs. The question of fats is still not settled, but meat fats are not well tolerated. Two ordinary polyvitamin capsules can be given daily. Treatment is otherwise symptomatic.

The effectiveness of this therapeutic regimen is shown for the present series in table 5. Group N, seen during the spring of 1944, received the generally accepted therapy of a high carbohydrate (350 Gm.), low fat (40 Gm.) and average protein (85 Gm.) diet with only moderate bed rest, whereas group R, studied during the summer of 1944, received a high protein (250 Gm.), high carbohydrate (350 Gm.) and low fat (40 Gm.) diet accompanied by strict and adequate bed rest. The better results in the R group are apparent and we believe significant, although the naturally variable course of this condition suggests caution in drawing final conclusions. It will be noted that fat was low in both diets, so that the effective nutritional factor must have been either the increased protein or the greater caloric intake which resulted from increased palatability. The more strictly enforced bed rest in the R group was also most effective.

It is important to search for any complicating conditions or foci of infection such as malaria, amebiasis or apical abscesses, especially if recovery is slow. Tonsils should not be removed unless severely infected, owing to the danger of precipitating a relapse.

The decision as to when a patient should be allowed up is difficult. Conservatism is obviously important. The criteria employed for acute hepatitis [1] are adequate, provided the patient is kept in bed for two or more additional weeks. The patient must be carefully followed during the ambulatory period and then for another two weeks if actually exercising or for perhaps four weeks if simply returning to work. If findings and symptoms recur, bed rest must be resumed.

INACTIVE HEPATITIS

We have reserved the term inactive hepatitis for patients who have objective evidence of liver disease or dysfunction and a past history of acute hepatitis but who have a normal exercise tolerance test. A large nontender liver or an increased sulfobromophthalein retention has been accepted as satisfactory evidence. Low grade elevation of the serum bilirubin might also be acceptable. Symptoms are limited to dyspepsia, gas, fat intolerance and slight fatigue, none of which are disabling. Since neither exercise nor rest has any significant effect on the clinical or laboratory picture, hospitalization or bed rest is unnecessary. It is therefore of great practical importance to distinguish this condition from active hepatitis. Furthermore, with the exception of the small group mentioned later, these patients are not disabled. The presence of additional symptoms of hepatitis suggests either activity of the process or a functional element.

Seventy-four per cent of all acute cases in the N group that recovered (81 cases) fell into the inactive category at the time of discharge to duty as judged by the sulfobromophthalein test. Thirty-two per cent of the total had a dye retention of from 5 to 9 per cent in one hour, and in 42 per cent it was 3 or 4 per cent in one hour.

TABLE 7.—*Gradual Improvement in a Case of Inactive Hepatitis Without Treatment*

	Jan.	April		May				June	Dec.
	1	19	29	6	13	20	27	3	3
Sulfobromophthalein, per cent retention in 30/60 minutes.....	..	15/3	16/5	22/7	9/5	12/6	18/8	6/5	6/2
Liver size, fingerbreadths below costal margin...	..	2F	1-2F	—	2-3F	1-2F	1-2F	1-2F	1-2F
Onset of acute hepatitis	X								

The average period of hospitalization in this group was sixty-six days. It is evident that complete recovery from infectious hepatitis usually requires at least two months and that inactive hepatitis represents the last stage in healing.

The eventual prognosis of inactive hepatitis is not known, but from a clinical point of view it appears to be excellent. In some cases progressive improvement in findings may continue to occur for many months even though the patient is on duty, as shown in table 7. This officer returned to work about April 22, explaining the increase in abnormal findings following the first test. He remained on duty throughout the period of these observations without symptoms and without liver tenderness. We have seen many similar cases in which findings were still present at the end of a year.

A special group of cases must be mentioned, fortunately small in number, who fall into the inactive category. In addition to the usual picture they show decided weight loss, true weakness, fatigue and gastrointestinal symptoms. They are often repeatedly hospitalized without benefit. In 1 instance the condition has remained static for three years. It is probable that these cases represent a relatively severe form of inactive hepatitis.

Treatment of the ordinary case of inactive hepatitis is unnecessary. In fact it is desirable to encourage normal activities so as to avoid mental fixation on the residual symptoms. A continuation of the dietary regimen, if feasible, can of course do no harm. In the special group mentioned, the diet is probably important and

should be continued for six to twelve months or until recovery occurs. Physical exertion should be limited to light duties.

COMMENT

We have referred advisedly to chronic hepatitis as a syndrome. It is believed that our cases represent a single disease entity, but it is likely that other etiologic types of hepatitis may present a similar clinical picture. The etiology in our group is, as yet, not entirely clear. It appears probable that the infectious agent of the acute disease is still present and that the liver lesion is at least in part of an infectious nature. The frequent occurrence of icteric relapse even though jaundice was absent in the initial acute attack is strong evidence for this point of view. There is no reason to believe that nonicteric cases differ at all from those with jaundice except as regards severity. A past history consistent with acute hepatitis was always obtained. Furthermore, the abnormal clinical and chemical response to exercise uniformly present suggests that under proper circumstances any of these patients are capable of developing an icteric relapse. Thus, persistent infection appears to be one of the chief etiologic factors. It is possible that reinfection may be of importance in some cases. Recovery is probably prevented or delayed by inadequate rest, poor nutrition and intercurrent infection. Final judgment must await demonstration of the infectious agent.

A direct nutritional effect on the liver [8] is probably an etiologic factor in certain cases. Its importance is difficult to assess. The fact that chronic hepatitis can occur in apparently well nourished persons and in patients on the recommended hepatitis diet indicates that this explanation of chronic hepatitis is not always valid. The possibility of a purely nutritional liver lesion must be considered and may well occur, but it is very unlikely that this is the cause of the cases described in this report.

The relationship of the symptomatology here described to liver disease has not been previously recognized. The correlation between symptoms and the laboratory and clinical evidence of activity of the hepatitis is so definite that it is only reasonable to assume a causal relationship. It is possible that other etiologic types of hepatitis may be associated with a similar clinical picture. Chronic brucellosis and protracted convalescence in infectious mononucleosis may fall in this category as well as certain cases of so-called functional bowel disorders. It may be that certain symptoms in these conditions hitherto unexplained will prove to be related to a form of hepatitis.

SUMMARY

1. The syndrome of chronic infectious hepatitis is a reasonably common condition of a disabling nature.

2. The most characteristic and diagnostic feature is the increase in physical findings, symptoms and laboratory evidence of liver dysfunction produced by exercise. Frequently a patient appears to have recovered while on minimal exercise, but an increase in physical activity will cause the clinical syndrome to reappear.

3. The essential treatment is adequate bed rest and a high protein diet.

4. There is an important distinction between active and inactive hepatitis. The latter group includes cases with objective evidence of liver disease and a normal reaction to exercise. Symptoms are not disabling, and no treatment is necessary.

8. Himsworth, H. P., and Glynn, L. E.: Prevention of Experimental Massive Hepatic Necrosis by Methionine, Clin. Sc. **5**: 133 (Aug.) 1944; Toxipathic and Trophopathic Hepatitis,[5] György, P.: Experimental Hepatic Injury, Am. J. Clin. Path. **14**: 67 (Feb.) 1944.

PSEUDO-GAS GANGRENE OF THE HAND

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Aeriform infections of the hand of industrial origin, unrelated to the usual gas producing anaerobes, have not been previously described in this country. Recently 3 cases presenting such a syndrome were reported from two plants where an alloy containing 90 per cent magnesium was being utilized in manufacturing processes. Gas bacillus infection was the initial diagnosis in each instance and therapy with gas gangrene antitoxin had been instituted. Bacteriologic studies did not, however, reveal the presence of gas forming anaerobes. In all 3 cases the appearance of the infection followed an accidentally incised wound received shortly after handling magnesium. Fortunately radical surgical procedures were not performed.

Study of the possible hazards associated with the use of magnesium was stimulated by the recently increased demand for this metal throughout the aircraft manufacturing industry. These studies disclosed that an alloy containing at least 89 per cent magnesium, when introduced beneath the skin of rats, produced macroscopic tumor masses.[1] This phenomenon occurred when as little as 10 mg. of powdered magnesium was injected.[2] These observations were confirmed by Schulz and Walter.[3] Both groups of workers found that at least a portion of the gas produced in this manner was hydrogen.

It has been known for some time that, in human beings, contact of magnesium with body fluids and tissues stimulates the evolution of gas. Seelig [4] in 1924 noted that gaseous cysts formed about magnesium when this metal was used as suture material in certain operative procedures. The more recent investigations demonstrated that powdered magnesium produced larger tumors than spicules of this metal.[2] Subcutaneous injection of aluminum and alloys containing less than 89 per cent magnesium was not followed by formation of gas in animal tissues.[1]

PURPOSE AND METHODS

The purpose of this study is to present the clinical manifestations of a syndrome which may simulate gas gangrene. The nature of the causative agent is unknown. However, bearing in mind the evidence acquired by animal research and the occurrence of all 3 cases in an environment where finely powdered magnesium was plentiful, the possibility is suggested that this metal constitutes a significant factor in the etiology. Irrespective of its cause, the signs and symptoms present a well defined clinical entity which must be differentiated from gas bacillus infections. Confusion of these conditions may give rise to serious consequences.

1. McCord, C. P.; Prendergast, J. J.; Meek, S. F., and Harrold, G. C.: Chemical Gas Gangrene from Metallic Magnesium, Indust. Med. **11**: 71-76 (Feb.) 1942.

2. Meek, S. F.; Prendergast, J. J.; Harrold, G. C., and McCord, C. P.: Physiological Action of Metallic Magnesium, J. Indust. Hyg. & Toxicol. **24**: 142-147 (June) 1942.

3. Schulz, R. Z., and Walter, C. W.: Magnesiogenous Pneumagranuloma, J. Indust. Hyg. & Toxicol. **24**: 148-153 (June) 1942.

4. Seelig, M. G.: Study of Magnesium Wire as Absorbable Suture and Ligature Material, Arch. Surg. **8**: 669-677 (March) 1924.

In addition to the clinical description of the syndrome, certain bacteriologic studies were performed. Cultures were taken of the lesions, of cutting oils and of tools and machines used by the patients. Samples of powdered magnesium found on the lathes and other machines were also examined bacteriologically.

Cultures were grown both aerobically and anaerobically. After isolation in pure culture, identification of individual organisms was carried out as completely as possible.

RESULTS OF BACTERIOLOGIC STUDIES

Not a single organism of the gas forming anaerobes was isolated either from lesions of the patients or from materials and tools used at the plants. A Staphylococcus aureus was recovered from the operative wound of patients 1 and 3. Cultures of 1 of these (patient 3) had been negative until several incised areas became secondarily infected. Cultures from the incision of the third patient were negative both at operation and during the subsequent course.

A greater variety of organisms was cultured from the soluble than the insoluble oils, as shown in the table.

Bacteria Isolated from Machine Shop Materials

Material Cultured	Organism Isolated	Number of Specimens from Which Isolated
Insoluble oil (4 specimens)	Staphylococcus albus	2
	Gram negative chromogenic bacilli (orange)	1
	Gram positive nonsporulating bacilli	1
	Aerobic spore-bearing bacilli	1
Soluble oil (4 specimens)	Gram negative lactose-fermenting bacilli	3
	Gram negative fluorescent bacilli of the family Pseudomonadaceae	3
Magnesium (2 specimens)	Aerobic spore-bearing bacilli	2
	Staphylococcus albus	1
	Gram negative lactose-fermenting bacilli	1
	Streptococci, green producing on blood agar and fermenting lactose and mannite	1
Table grinding mill	Aerobic spore-bearing bacilli	1
	Gram negative lactose-fermenting bacilli	1
Sarno lathe	Gram negative lactose-fermenting bacilli	1

Bacteria belonging to the family Pseudomonadaceae were the most frequent contaminants of the soluble oils. Lactose fermenting bacteria were also demonstrated in these oils. Several varieties of bacteria were recovered from the insoluble oils.

REPORT OF CASES

CASE 1.—*History.*—F. O., a white woman aged 32, admitted to the hospital on Nov. 13, 1943 complaining of swelling and a "feeling of numbness" of the right ring finger and hand, had been perfectly well until 12:50 a. m. on the morning of the day of admission.

While she was employed as a lathe operator, a magnesium adapter with which she was working slipped and lacerated the dorsum of the right ring finger.

The laceration, which occurred over the dorsum of the distal phalangeal joint, was about one-half inch in width and bled freely. First aid was administered by the plant nurse. At 3 a. m. the patient noticed that the finger had swollen considerably and that the swelling had spread to the back of the hand. At 2 p. m. on the same day, alarmed by the swelling and dull pain in the finger and hand, she consulted her physician. By this time the swelling involved the entire dorsum of the hand. The physician advised immediate hospitalization.

The patient had been working for some time with an alloy containing 90 per cent magnesium. Not infrequently her hands came in contact with fine particles of this material, which were difficult to remove because of the presence of cutting oils.

Her temperature on admission was 99 F. and pulse rate 100. Examination of the right hand revealed considerable swelling of the dorsum of the ring finger and hand, where there was crepitation. On palpation of the hand there was a peculiar sensation described by the examining physician as "crushed egg shells in a cloth bag." Physical examination was otherwise negative.

Laboratory examination revealed a red blood cell count of 4,100,000 and hemoglobin 84 per cent (Sahli). The white blood cell count was 6,600 and the blood smear revealed polymorphonuclears 52 per cent, lymphocytes 40 per cent, monocytes 3 per cent and eosinophils 5 per cent. Urinalysis was negative. Cultures of the hand taken at the time of operation revealed a hemolytic Staphylococcus aureus and a gram negative bacillus.

Course.—With a diagnosis of gas bacillus infection, operation was performed at 6 p. m. Although amputation had been suggested by a consultant, surgery was limited to two linear incisions over the dorsum of the hand, each about 4 inches in length. There was a perceptible decrease in the amount of swelling after the incision. The wound was irrigated with peroxide and diluted solution of sodium hypochlorite. The patient received 10,000 units of tetanus antitoxin on admission and, in addition, 45,000 units of gas gangrene antitoxin over a period of three days. She also received a total of 23 Gm. of sulfathiazole in five days.

Postoperatively the temperature rose to 101.6 F. and remained elevated for two days, following which it was normal. The patient complained of pain in the hand and wrist. There was some stiffness of the fingers. On November 22, under sodium pentothal anesthesia, the edges of the wound were approximated and closed with Michel clamps. Except for some residual stiffness of the third, fourth and fifth fingers of the right hand, convalescence was uneventful.

CASE 2.—*History.*—J. A., a white man aged 23, married, admitted to the hospital on Feb. 28, 1944, complained of pain and swelling of the left ring finger and hand. About 2 p. m., while reaming a coil on a lathe, he lacerated the tip of the left ring finger. He had been tooling objects made of 90 per cent magnesium. During the course of his work, his hands and the lathe usually became covered with fine magnesium particles. Ten minutes after the laceration he noted that his finger had become swollen and painful. He could not remove a ring worn on the cut finger. The pain became so severe that he had to leave his work. The plant nurse suggested that he consult his family physician. At 2:40 p. m., when he visited his doctor, the swelling had progressed to the dorsum of the hand as far as the wrist; his hand was now as large as a "boxing glove." The family physician made a tentative diagnosis of gas bacillus infection and advised hospitalization.

The temperature on admission was 99.2 F. and the pulse rate 100. The physical examination revealed that the patient, who was fairly well developed, was in a great deal of pain. Examination of the hand revealed a small laceration over the tip of the left ring finger. The finger and hand were swollen to the wrist. There was crepitation over the dorsum of the hand and ring finger.

Laboratory Examination.—The red blood cell count was 3,900,000, hemoglobin 78 per cent (Sahli) and white blood cell count 16,700. The blood smear showed polymorphonuclears 93 per cent, lymphocytes 7 per cent. Urinalysis was negative. Blood cultures on February 29 and March 1 were negative. Cultures taken of the hand at operation revealed no growth.

Course.—The patient was given 30,000 units of gas gangrene antitoxin and was started on sulfathiazole (total dosage 12 Gm. in forty-eight hours). Operation was performed at 5 p. m. on the day of admission. Three linear incisions were made over the dorsum of the hand extending from the knuckles to just above the wrist. An additional linear incision was made on the ventral surface of the palm, and "through and through drainage" was instituted. There was a definite decrease in the amount of swelling immediately after incision.

During the subsequent course there was no evidence of spread beyond the operative incision. The temperature rose to 103 F. immediately after the operation and remained elevated for forty-eight hours. Thereafter, except for a slight rise to 99 F. on the fifth hospital day, it was normal. The pulse rate was

about 100 for five days. On March 2 the patient developed an infection of the mucous membrane of the mouth and tongue. On March 6 the drains were removed. Five days later, under anesthesia, the wounds were closed with Michel clips. Convalescence was uneventful. The wounds healed without difficulty. The patient was discharged from the hospital on March 18, 1944.

CASE 3.—*History.*—M. S., a white man aged 38, married, a machinist, admitted to the hospital on Sept. 23, 1944, complained of pain and swelling of the left hand and arm. About 6:45 p. m., while at work, a file slipped and punctured his left thumb. For two or three hours prior to the accident he had been "setting up" machines on which objects made of a 90 per cent magnesium alloy were being tooled.

The point of the file penetrated the skin, and there was a moderate amount of bleeding. Despite the injury, he continued at his work. About ten minutes later he noticed a feeling of numbness of the hand. Tapping the back of his left hand with the right caused a peculiar sensation which he described as "air in a football." When he consulted the plant nurse for first aid, she also expressed the opinion that there was air beneath the skin and advised that he see his doctor. He arrived at his physician's office about 7:45 p. m., approximately one hour later. At this time the swelling had progressed beyond the dorsum of the hand to the arm. His physician advised immediate hospitalization. The swelling continued to spread; at 10:30 p. m. it had reached a point 2 inches below the shoulder.

The temperature on admission was 98.8 F., the pulse rate 80 and the respiratory rate 16. Physical examination showed that the patient was well developed and well nourished and that his general appearance was good. The dorsum of the left hand, thumb and arm was swollen. There were tenderness and crepitation throughout the arm. In some areas bubbles beneath the skin felt "as large as eggs." Except for the palm, there was crepitation of the entire left extremity.

Laboratory Examination.—The red blood cell count on September 24 was 4,050,000, hemoglobin 85 per cent (Sahli). The white blood cell counts rose from 10,000 on September 23 to 47,000 on September 29 and gradually dropped to 7,600 on October 9. The blood smear showed a gradual rise of polymorphonuclears from 76 per cent on September 23 to 95 per cent on September 30 and then gradually dropped to 50 per cent on October 9. Blood cultures on September 27, September 30 and October 4 were negative. Urinalyses were negative except that occasionally there was the slightest possible trace of albumin. Cultures of the hand at operation revealed no growth. On October 4 cultures of the wound were positive for hemolytic Staphylococcus aureus.

Course.—Operation was performed at 11 p. m. (four and one-half hours after injury). Under sodium pentothal anesthesia numerous incisions (about twenty-two) were made from a point just below the shoulder to the dorsum of the hand. The incisions varied from 2 to 6 inches in length and extended through the skin, fat and superficial fascia to the muscles and tendons. The surgeon noted very little resistance to the scalpel. After incision the swelling subsided to a great extent. Dakin tubes were inserted into the wounds and kept in place by sutures. The wounds were irrigated with peroxide.

The temperature remained normal until the second postoperative day, when it rose to 100 F. and remained elevated until September 27. Subsequently the temperature remained normal until October 5, when there was a slight elevation which lasted about forty-eight hours. The pulse was not high throughout the entire course.

During the first three days of his hospital stay the patient received 30,000 units of gas gangrene antitoxin. On September 23 he was given 30,000 units of penicillin and thereafter he received 20,000 units, intramuscularly, every three hours until September 28. On September 29 the dosage was reduced to 10,000 units every three hours. Sulfadiazine therapy was instituted on September 24, and the patient received 1 Gm. every four hours until September 27.

On September 29 the patient developed herpes of the nose, lips and left cheek. Several of the wounds had become secondarily infected, and there was a moderate amount of purulent drainage. On October 7 all drains had been removed and, under sodium pentothal anesthesia, the wounds were closed with Michel clips. Recovery was uneventful thereafter, and the patient was discharged on October 18 with full use of his arm.

COMMENT

The similarity in the symptomatology and clinical course of the 3 cases is apparent. Of interest is the rapidity with which swelling and crepitation appeared subsequent to the rather trivial injury sustained by each patient. In all 3 cases swelling was noted after an interval of only ten minutes. In 2 cases (2 and 3) crepitation was found by the attending physician one hour after injury.

Of the 3 patients 2 (F. O. and M. S.) had been employed in the same plant. In each instance a superficial laceration had occurred after handling powdered magnesium (a 90 per cent alloy). In 1 case the injury was caused by an object made of this metal.

The rapid accumulation of gas beneath the skin of these patients suggests that a chemical may have been the responsible agent. The studies previously mentioned have demonstrated that the rapidity with which gas appears beneath the skin subsequent to injections of powdered magnesium varies a great deal, depending on the species of animal used in the experiment.[1] In rats, for example, this phenomenon occurs more readily than in guinea pigs. Schulz and Walter in their experiments noted the appearance of gas bubbles fifteen minutes after the subcutaneous injection of powdered magnesium. It is questionable whether any known bacterial agent, acting independently, would have been capable of producing local reactions with such rapidity.

Although gas gangrene had been suspected in each of the 3 cases, subsequent study eliminated this diagnosis. The injury which precipitated the syndrome in all 3 patients did not produce extensive laceration or damage to muscle tissue. It is well known that gas gangrene usually develops in a deep, punctured or lacerated wound which extends into muscle and carries with it such foreign bodies as clothing, powder or débris. The constitutional reaction, which is usually severe in gas bacillus infection, was insignificant in these cases. One patient (M. S.) had a normal temperature on admission in spite of involvement of almost the entire arm. The course remained afebrile until the second postoperative day, when several of his wounds became septic. Similarly, a prolonged elevation of temperature was not shown by either of the other 2 cases.

The syndrome discussed in this paper may also be confused with hemolytic streptococcic gangrene described by Meleney.[5] In this condition too a superficial injury is usually the precipitating factor and subcutaneous tissues are involved in the pathologic picture. However, tumor masses and crepitation do not occur and the rate of spread from the point of injury is less rapid than was observed in these cases. Blisters and bullae develop late in the course of hemolytic streptococcic gangrene.

The bacteriologic studies did not reveal an organism common to all 3 patients. Similarly, cultures of cutting oils and other materials revealed several organisms apparently unrelated to the etiology of this syndrome. Further studies are being carried on with these bacteria.

5. Meleney, F. L.: A Differential Diagnosis Between Certain Types of Infectious Gangrene of the Skin, Surg., Gynec. & Obst. **56**: 847-865 (May) 1933.

It may be postulated that a bacterial agent, acting synergistically with the magnesium alloy, may have been responsible for the syndrome. It has, however, been shown that in animals tumor masses may be produced by the injection of sterile magnesium. Further research will determine whether the pathologic process may be accelerated by the presence of certain bacteria in addition to the magnesium.

Whether or not the powdered magnesium alloy is the etiologic agent, this syndrome must be borne in mind in the differential diagnosis of infection characterized by the presence of gas beneath the skin. It is hoped that this discussion will be helpful in bringing other similar cases to light.

SUMMARY

1. Three cases of a new syndrome characterized by the rapid appearance of subcutaneous gas tumor masses within a few minutes after a superficial laceration of the hand occurred in two plants where an alloy composed of 90 per cent magnesium was being used. Each patient had handled this material in a finely powdered form prior to the occurrence of injury.

2. It is possible that an etiologic relationship of this alloy to the syndrome exists.

3. Because this syndrome may simulate gas gangrene, it is important that its clinical characteristics be borne in mind in order that unnecessary surgical procedures may be avoided.

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VESICOURETERAL REFLUX ACCOMPANIED BY RENAL COLIC

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The occurrence of vesicoureteral reflux has been recognized for many years. Importance has been attached to its significance as an etiologic factor in upper urinary tract infection and renal damage secondary to back pressure. Extensive studies were made by Graves and Davidoff [1] in this connection, using rabbits and dogs. Their principal clinical interest was in connection with its relation to upper urinary tract infections. It was not until 1934 that the role of vesicoureteral reflux in the production of renal colic was forcefully brought to attention by Lewis and Carroll,[2] who presented 30 cases of symptomatic vesicoureteral reflux. All cases described by them were secondary to vesical neck or urethral obstruction, and the symptomatology described was characterized by typical renal colic, occurring usually in the presence of a distended bladder, when the patient attempted to void. Individual cases were presented by several other authors in connection with their article. Little has been written since that time concerning this clinical syndrome, and it is felt that attention should again be directed to this condition, particularly with reference to its occurrence in cases of stones in the lower ureter after operative manipulation for their removal. That vesicoureteral reflux occurs with considerably more frequency than is ordinarily suspected is emphasized

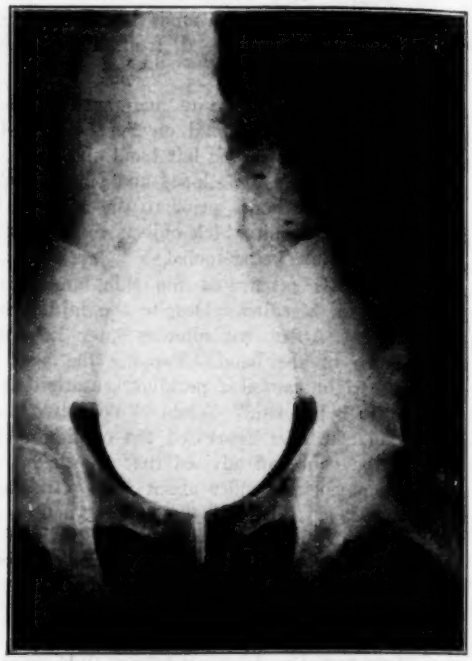

Fig. 1.—Vesicoureteral reflux in left ureter.

by Aschner,[3] who reported its presence in 14 per cent of 202 cases in which cystograms were made.

The value of a cystogram, taken after voiding, in the diagnosis of vesicoureteral reflux is clearly demonstrated

Fig. 2.—Vesicoureteral reflux in right ureter and kidney pelvis.

in 1 of our patients. This procedure was described by Bartrina,[4] who recommended the use of cystograms taken while the patient was voiding for the demonstra-

1. Graves, R. C., and Davidoff, L. M.: Studies on the Ureter and Bladder, with Especial Reference to Regurgitation of the Vesical Contents, Tr. Am. A. Genito-Urin. Surgeons **16**: 25-71, 1923.

2. Lewis, Bransford, and Carroll, Grayson: Further Clinical Evidences on Regurgitation Renal Colic, Urol. & Cutan. Rev. **38**: 185-189 (March) 1934.

3. Aschner, P. W.: Vesicoureteral Reflux in Cystography, Am. J. Surg. **4**: 448-449 (April) 1928.

4. Bartrina, Jose: Some Considerations on Insufficiency of the Vesicoureteral Valve, Urol. & Cutan. Rev. **39**: 167-172 (March) 1935.

tion of reflux. My associates and I have followed his technic with some modification, namely filling the bladder with opaque solution, taking an x-ray, having the patient void and then taking a second film.

The etiologic factors involved in the production of vesicoureteral reflux may be divided into three groups as described by Cace:[5] (1) produced by (*a*) mechanical causes obstructing flow at the vesical neck and producing dilatation upward, (*b*) alterations of the ureteral orifice due to chemical causes, postoperative cicatrices, chronic inflammatory lesions such as tuberculosis, or cancer involving the ureteral orifice; (2) dynamic, produced by nerve lesions involving the cauda equina, and (3) congenital malformations, with special emphasis on obstruction at the vesical neck due to urethral valves. Vermooten and Neuswanger[6] were able to produce vesicoureteral reflux in dogs by incision of the ureterovesical valve. They observel that actual

Fig. 3.—Same case as figure 2 after voiding. Note increased filling of ureter and pelvis.

dilatation of the upper tract resulted only when there was both an infected urine and a ureteritis.

Henningsen[7] presented 28 cases of various lesions of the genitourinary tract in which x-ray studies had been made with the finding of reflux in 4 cases, 3 with prostatic hypertrophy, 1 with tuberculous cystitis. Verrière[8] presented 3 cases of vesicoureteral reflux occurring following the accidental injection of caustic solutions into the bladder. Dietel[9] discussed ureteral reflux in connection with pregnancy, with particular reference to its relation to pyelitis. He was unable to demonstrate its presence in any of 50 cases studied by cystography, and his conclusion was that the condition occurred rarely when normal ureterovesical valves were present. Prather[10] recently described a case following extensive injury to the bladder and posterior

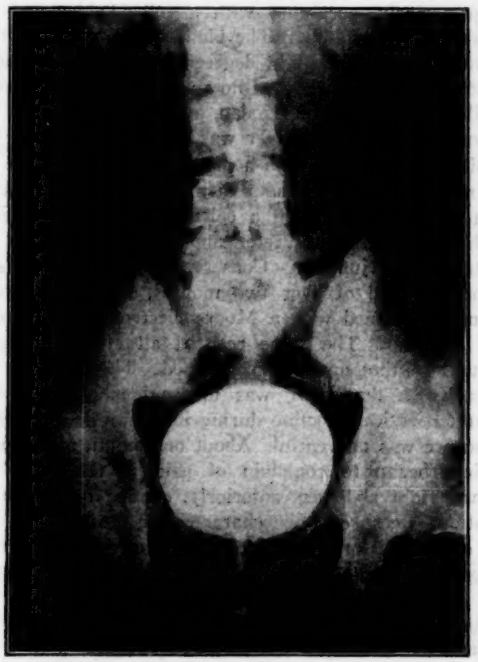

Fig. 4.—Regular cystogram demonstrating complete absence of dye in ureter and kidney pelvis, except for small shadows in minor calices.

urethra with cure following operative intervention. None of these authors made any mention of renal colic as occurring with ureteral reflux.

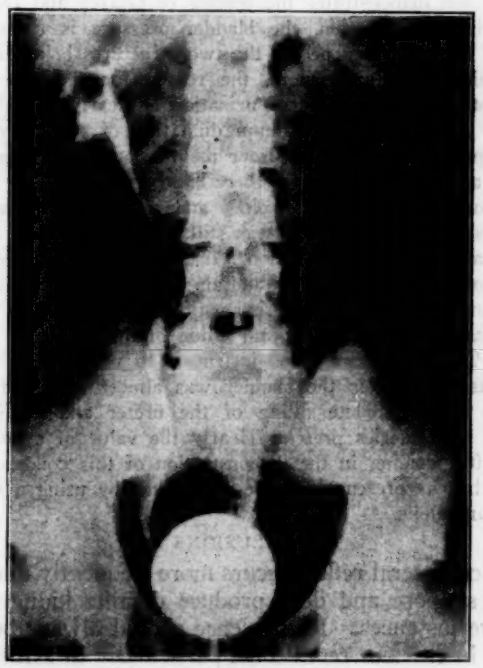

Fig. 5.—Same patient as figure 4 immediately after voiding, showing complete filling of ureter and pelvis.

We have had 2 cases with typical renal colic resulting from vesicoureteral reflux:

A white man aged 45 was found to have a calculus, 8 by 12 mm. in size, lodged within the left ureteral orifice, producing

5. Cace, M.: Clinical and Roentgen Study of Vesicoureteral Reflux, with Report of 7 Cases, Policlinico (sez. chir.) **46**: 53-63 (Feb.) 1939.
6. Vermooten, Vincent, and Neuswanger, C. H.: Effects on the Upper Urinary Tract in Dogs of an Incompetent Ureterovesical Valve, J. Urol. **32**: 330-334 (Oct.) 1934.
7. Henningsen, O.: Clinical and Experimental Study of Possibilities of Vesicoureteral Reflux, Ztschr. f. Urol. **31**: 505-523, 1937.
8. Verrière, P.: Forced Ureters: Ureterovesical Reflux After Penetration of Caustic Fluid into Bladder: Three Cases, Bull. Soc. franç. d'urol., June 20, 1938, pp. 222-230.
9. Dietel, H.: Regurgitation from Bladder, Zentralbl. f. Gynäk. **63**: 998-1005 (May 6) 1939.
10. Prather, G. C.: Vesicoureteral Reflux: Report of Case Cured by Operation, J. Urol. **52**: 437-448 (Nov.) 1944.

severe left renal colic. Ureteral meatotomy was performed by means of a cystoscopic scissors and two days later the calculus was passed. Convalescence was uneventful except that the patient began to complain of severe pain in the left kidney region posteriorly, occurring with a full bladder and immediately relieved by voiding. The bladder showed mild trabeculation, and there was a slight degree of prostatic encroachment at the vesical neck. There was no residual urine. A cystogram was made with 500 cc. of skiodan, and a definite reflux in the lower portion of the left ureter was demonstrated (fig. 1).

A white man aged 29, with a diagnosis of right renal calculi made six months prior to admission, presented a typical renal colic on the right side, and a calculus, 2 by 5 mm. in size, was lodged in the right ureter approximately 1.5 cm. above the ureterovesical junction. Conservative treatment was instituted for a period of over two months, including a ureteral meatotomy performed with a Moore electrotome, and repeated ureteral dilations. The stone resisted all efforts at removal, and a ureterolithotomy was performed. The location of the stone was such that there was unquestionably some damage to the ureterovesical junction during its removal. Postoperative convalescence was uneventful. About one month after operation the patient began to complain of pain in the right kidney region and right abdomen, anteriorly, coming on near the end of urination. Because of the characteristic location of the pain and the clinical history, vesicoureteral reflux was suspected and a cystogram was made with 300 cc. of 10 per cent skiodan. A film was taken, which presented a complete filling of the ureter and pelvis on the right side (fig. 2). The patient was then instructed to empty his bladder partially, and a second film was made (fig. 3). During this process the typical pain of which he complained was reproduced. It is noteworthy that in the second film there was considerably more filling of the calices and definite dilatation of the ureter with some angulation. This was undoubtedly brought about by transmission of bladder pressure up the ureter during voiding. This phenomenon demonstrates the finding of Graves and Davidoff that, with regurgitation, the bladder pressure is transmitted directly to the kidney pelvis, the two structures being in open communication. Furthermore, the reason for the appearance of symptoms near the end of urination is clearly brought out, because at this point maximum dilatation of the ureter and kidney pelvis was obtained. Four months later the patient was studied again. In the interval there had been a moderate degree of improvement in symptomatology and, although the symptoms were less pronounced, there was still some pain in the kidney region at the end of urination. The bladder was filled with 550 cc. of 10 per cent skiodan and an x-ray made (fig. 4). Only a few small shadows in the region of the minor calices of the kidney appeared. There was no filling of the ureter or kidney pelvis. The patient was then instructed to void, and a second film was made after the bladder was almost empty (fig. 5). At this time complete filling of the ureter and pelvis was present. This series presents clearly the value of cystograms taken after voiding in the demonstration of this condition and shows that its presence may be overlooked by using a routine cystogram alone.

CONCLUSIONS

Vesicoureteral reflux occurs more frequently than one would suppose and does produce definite kidney colic in some instances. Its presence should always be suspected in cases of renal colic, particularly in association with obstruction at the vesical neck when no stone is demonstrated.

Operative manipulation on the lower ureter with subsequent damage to the ureterovesical valve is occasionally followed by vesicoureteral reflux.

The employment of a cystogram made after the patient has voided, rather than the use of simple filling of the bladder with a contrast medium, is of definite value in demonstrating this condition.

ARACHNOIDITIS AND PARALYSIS FOLLOWING SPINAL ANESTHESIA

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The literature has many reports of sequelae involving the nervous system after spinal anesthesia. These have been disturbances in sensation, stiff neck, cranial nerve involvement (second, third, fourth, sixth, seventh, eighth and twelfth), impaired bladder and rectal function, hemiplegia and paraplegia, pyramidal tract degeneration, meningoencephalitis, polioencephalitis, myelitis, myelopathy, radiculitis, severe "neuritis," septic and aseptic meningitis, arachnoiditis, cauda equina neuritis and others.[1]

Falk[2] reported headache and stiff neck lasting several days in about 6 per cent of persons after spinal anesthesia. This he regarded not as a complication but as a normal result of spinal anesthesia. More seriously, meningitis has been often reported after spinal anesthesia.[3] In 8 cases of so-called aseptic meningitis there were three deaths;[4] the others were "benign" and recovered. In that series, symptoms began sixty hours after the anesthetic had entered the subarachnoid space. There was an increase of lymphocytes in the spinal fluid which disappeared slowly; such a pathologic picture is quite different from the chronic progressive fibrinous arachnoiditis to be reported now. Hammes[5] described 8 cases with neurologic signs following spinal anesthesia; of these 2 were labeled "chronic arachnoiditis." This diagnosis was a clinical impression supplemented in one case by iodized oil x-ray studies and was not confirmed by operation.

The only verified case of localized arachnoiditis thus far reported was described by Haynes and Smith.[6] Their patient had signs of cervical cord involvement four days after injection of a pontocaine glucose solution into the lumbar subarachnoid space. Two months later a cervical laminectomy was done; adhesions were found between the arachnoid and cervical cord covering the anterior and posterior nerve roots of the second, third and fourth cervical segments. Some of the adhesions were lysed and improvement followed.

Death has followed spinal anesthesia from involvement of the nervous system. Its incidence in three series has been reported as (*a*) 5 in 120,000 cases,[7]

From the Neurological Service of Bellevue Hospital.

1. Kamman, G., and Baker, A. B.: Damage to Spinal Cord and Meninges Following Spinal Anesthesia, Minnesota Med. **26**: 786-791 (Sept.) 1943. Konig, F.: Bleibende Ruckenmarkslahmung nach Lumbalanesthesie, München. med. Wchnschr. **53**: 1112-1113 (June 5) 1906. Koster, H., and Weinrah, M.: Complications of Spinal Anesthesia, Am. J. Surg. **8**: 1165-1179 (June) 1930. Light, Sweet, Livingstone and Engel.[2] Livingstone, Wellman, Clark and Lambros.[4] Tihen.[3]

2. Falk, H. C.: Deaths from Spinal Anesthesia, Am. J. Surg. **11**: 461-464 (March) 1931.

3. Light, G.; Sweet, W. H.; Livingstone, H., and Engel, R.: Neurological Changes Following Spinal Anesthesia, Surgery **7**: 138-156 (Jan.) 1940. Tihen, H. N.: Aseptic Meningitis Following Spinal Anesthesia, J. Kansas M. Soc. **38**: 100-101 (March) 1937. Campbell, H. E.: Aseptic Meningitis: Another Hazard in Spinal Anesthesia, Chinese M. J. **49**: 119-131 (Feb.) 1935. Hammes.[5] Haynes and Smith.[6] Brock, Bell and Davison.[10]

4. Livingstone, H.; Wellman, V.; Clark, D., and Lambros, V. S.: So-called "Aseptic or Chemical Meningitis" Surg., Gynec. & Obst. **77**: 216-218 (Aug.) 1943.

5. Hammes, E. M.: Neurological Complications Associated with Spinal Anesthesia, Minnesota Med. **36**: 339-345 (April) 1943.

6. Haynes, W. G., and Smith, F. A.: Cervical Arachnoiditis Occurring After Spinal Anesthesia, Anesthesiology **3**: 444-447 (July) 1942.

7. Angelesco, C., and Tzovaru, S.: Some Remarks on the Mortality in 120,500 Cases of Spinal Arachnoiditis, Presse méd. **41**: 1904-1906 (Nov. 25) 1933.

(*b*) none in 250,895 cases [8] and (*c*) 3 in 4,010 cases.[9] In the first series the cause of death was meningitis, septic and aseptic. In the last series death was ascribed to "spinal shock." On autopsy such cases have decidedly thickened meninges and clear evidence of myelopathy. Those cases are much more severe than ours: apparently there was a primary involvement of the spinal cord and a secondary morbid process in the meninges.

REPORT OF CASES

CASE 1.—B. R., a woman aged 51, a housewife, admitted to the neurologic service of Bellevue Hospital on May 24, 1944, was in good health until the early part of 1941, when she was found to have a fibromyoma of the uterus. On April 17, 1941 hysterectomy was done under spinal anesthesia. The anesthetic agent was 125 mg. of procaine. The immediate postoperative course was uneventful and she was discharged from the hospital eleven days after the operation. Four days later she noticed numbness and weakness of the lower extremities and difficulty in walking. These symptoms became gradually worse despite massage and "chiropractic treatment." In the early part of 1943 the left foot dragged on walking. There was stiffness of the left leg in January 1944. This grew worse; by March there was added pain in the upper back and shoulder girdle radiating to the hands. The patient then became incontinent of urine and feces.

On admission the general physical status was normal. However, she had slightly irregular pupils, the left larger than the right, spastic paraparesis of the lower extremities, atrophy of the peroneal muscles of both legs without fibrillations, absent abdominal reflexes, overactive knee jerks and occasionally clonus. The Babinski sign was positive on both sides. Sensory examination revealed diminution to pin prick below the first lumbar spinal segment, more pronounced on the right, diminution to hot and cold sensation below the second lumbar segment, impaired vibration sense below the third lumbar segment and impaired position sense in the toes. The perianal zone was spared. A lumbar puncture was done; the initial pressure was 120 mm. of spinal fluid. Jugular compression produced a slow rise in pressure; when the pressure was released the spinal fluid level fell slowly, indicating a partial block. The fluid contained 90 mg. of protein per hundred cubic centimeters of fluid and 3 lymphocytes per cubic millimeter. The Wassermann reaction was negative and the colloidal gold curve flat.

A preoperative diagnosis of "arachnoiditis secondary to spinal anesthesia" was made. Laminectomy was done on June 27, 1944: an obstructive arachnoiditis around the twelfth thoracic spinal segment was found. A soft rubber catheter was used to break up the adhesions and relieve the block. After operation the patient had a low grade fever for eight days. There was gradual improvement in her symptoms and she was able to void spontaneously on the eighteenth postoperative day. During the remaining twelve days of her hospitalization the patient received baking and massage.

A letter from the patient dated Sept. 25, 1944 states that she "can move her legs much more freely and can stand on her feet for a few minutes at a time."

This case history demonstrates two features: 1. The symptoms did not occur after operation until the patient had left the hospital; since she had completely recovered from the hysterectomy, she failed to correlate her paralytic complaints with any preceding surgical procedure. 2. The surgeon and the anesthetist were never informed by the patient of the postoperative complication.

CASE 2.—J. M., a man aged 50, a lithographer, admitted to the neurologic service of Bellevue Hospital on July 25, 1943, had been in good health until April 8, 1943, when a bilateral inguinal herniorrhaphy was done under spinal anesthesia. The anesthetic agent was 10 cc. of eucupine with procaine. There were no immediate postoperative complications and the patient was discharged from the hospital twenty-one days after operation. A few days later he complained of weakness of the lower extremities and of a dull pain in the low back area, radiating to both buttocks. These pains became progressively worse; in a few days more he noted pins and needles sensation in his feet. His condition deteriorated so that a week before coming to Bellevue Hospital he could not walk without support and passed urine with difficulty.

The general physical status was normal except for carious teeth, bilateral herniorrhaphy scars and weakness of the rectal sphincter tone. However, both legs were very weak, especially the peroneal muscles; there was foot and toe drop on both sides. The upper abdominal reflexes were depressed, the lowers absent. The knee and ankle jerks were more active on the right. The Babinski sign was present on the right and was equivocal on the left. There was unsustained ankle clonus on the right. Sensory examination revealed diminished appreciation of pain and temperature below the first lumbar spinal segment. Vibration sense was impaired at the hip and absent below the knees. Position sense was lost in the right foot and impaired in the left. The sacral area was spared. Several attempts at lumbar puncture failed to produce any spinal fluid. The blood Wassermann reaction was negative; blood count and urine were normal. X-ray examination showed no abnormality of the lumbar spine.

A preoperative diagnosis was made of "adhesive arachnoiditis secondary to spinal anesthesia." Laminectomy on Aug. 5, 1943 revealed adhesions completely encircling the conus medullaris. The nerve roots of the cauda equina were enmeshed by these fibrous bands. Lysis was performed wherever possible and free flow of spinal fluid established below the site of the adhesions. After operation the patient had many episodes of cystitis; these were controlled by Munro tidal drainage. Four months later the chronically ill patient was transferred to the Goldwater Memorial Hospital for further care. A report on Sept. 10, 1944 states that he has had some slight return of function in the lower extremities; he is still greatly disabled.

This case resembles the first in that symptoms did not occur till the patient had left the hospital. The anesthetist and the surgeon were alike unaware that their patient was suffering from severe sequelae of the spinal anesthesia, which they had recorded as being without complication.

CASE 3.—T. B., a man aged 29, a practical nurse, admitted to the neurologic service of Bellevue Hospital on Jan. 11, 1944, had been well till May 3, 1943, when he complained of sharp abdominal pain and was taken to the Jersey City Medical Center; there a diagnosis of acute appendicitis was made. Appendectomy was done under general anesthesia. The postoperative course was stormy; a septic type of fever frequently reached 104 F. Twenty-three days after operation the patient left the hospital against advice and was admitted to the Hospital of the United States Maritime Service Training Station at Sheepshead Bay. There he continued to have high fever; he complained of severe abdominal pain. A gastric x-ray examination revealed the appearances of a perforating ulcer.

On June 3, 1943 an exploratory laparotomy for a suspected perforating gastric ulcer was done under continuous spinal anesthesia. The anesthetic agent was metycaine; 2 cc. of a 10 per cent solution was diluted to 10 cc. with spinal fluid and given in fractional doses. Anesthesia was satisfactory except that at one time the patient complained of difficulty in breathing. An intratracheal tube was inserted and oxygen administered. Later, when the spinal needle was dislodged, the anesthesia was supplemented with cyclopropane and ether. Following operation, the patient's condition was good. On the fifth day fever recurred and he was unable to pass urine. Further, there was found paralysis of both lower extremities. The signs of spinal cord involvement spread upward to include the clavicular level and both upper extremities.

Three weeks after the operation the patient was completely paralyzed in the lower extremities and at times complained

8. Babcock, M. E.: Spinal Anesthetic Deaths: A Survey, Anesth. & Analg. **11**: 184-188 (July-Aug.) 1932.

9. Lyford, J.; Berger, O., and Schumacher, H. B.: An Analysis of Deaths in the Operating Rooms of the Johns Hopkins Hospital, with Special Reference to Those Occurring Under General and Spinal Anesthesia, Bull. Johns Hopkins Hosp. **70**: 488-503 (June) 1942.

of pains and tingling sensations in the arms and fingers. Within several weeks he began to regain some motion of the lower extremities so that he could walk with help. On discharge from the Maritime Service Hospital the patient was described as having a typical ataxic gait, without reflexes in the lower extremities.

On Dec. 17, 1943 he suffered burns of both knees as he leaned against a radiator. There was anesthesia of the lower extremities, and he lacked any appreciation of temperature. The burns were dressed in the emergency ward of Bellevue Hospital and subsequently elsewhere. The right knee became reddened and swollen; a week later the patient had stiffness of the neck and face and much difficulty in swallowing. On Dec. 24, 1943 he was admitted to Bellevue Hospital; here he was found to have tetanus. He received 420,000 units of tetanus antitoxin. Improvement was rapid and progressive. On Jan. 10, 1944 he was transferred to the neurologic service for study.

He was a well made man. General physical examination was negative except for the scars of burns and operations. There was a flaccid paralysis of both lower extremities. There was thinning of the hands attributed to disuse, as strength of the arms and grip was good. The deep tendon reflexes of the upper extremities were equally active; the upper abdominal reflexes were present, the lowers absent; the knee and ankle jerks were absent bilaterally. The Babinski sign was present on both sides. There was a loss of all forms of sensation below the ninth thoracic spinal segment. Coordination in the arm movements was good. The blood Wassermann reaction was negative; the urine and blood count were normal. Several attempts at lumbar puncture were made, but no fluid was obtained. On January 15 laminectomy from the fourth to the tenth thoracic spinal segments was carried out under general anesthesia. The dura was tightly adherent to the arachnoid and spinal cord; there was no free flow of spinal fluid. At the seventh thoracic segment a small calcified plaque was found in the arachnoid. Above the plaque a cystic tumor-like swelling of the cord was found, covered by tortuous veins. The dorsal columns were separated by blunt dissection but no cyst was encountered.

After operation there were paresthesias of the thighs and legs, and the sensory loss level receded from the ninth thoracic to the first lumbar segment. Motion of the legs improved. The postoperative course was complicated by a cystitis and epididymitis. He was given radiation therapy and was to have had a hip brace, but before it could be fitted he left against advice on the fifty-eighth postoperative day. At present the patient is at the United States Marine Hospital on Staten Island. His condition is unimproved.

Perhaps a postscript might be written here regarding a patient seen by one of us in private practice, referred by two of the best known medical men in the country as "neurotic":

Mrs. J. B., aged 49, complained of "shooting and tying up pains" around the body from below the breast to below the navel.

A hysterectomy had been performed three and one-half years before under spinal anesthesia. When the injection had been made, the arms and hands and legs went "numb and paralyzed," "the legs at once, the arms a few minutes later." She then began choking and stopped breathing. A pulmotor was used; she was brought back from the operating room to her bedroom and remained flat on her back for twelve hours. The arms and legs recovered power in about two hours, but "they all felt like chilblains for about ten hours longer." A new symptom appeared later, at which time "the left arm felt lame; there was pain in the forearm which occupied also the left inner fingers."

After hysterectomy she gained 50 pounds (23 Kg.) weight in five months and at the time of examination weighed 186 pounds (84 Kg.) in her underclothes. There was found severe hyperesthesia on the level of the fourth dorsal to the tenth dorsal segments on both front and back. She described the skin in this area as feeling "scalded." Her clothes were a great source of irritation.

The left knee jerk and left ankle jerk were present sharply without reinforcement. The right knee jerk and right ankle jerk were absent on reinforcement. In addition, she proved to have a bursitis over the head of the left radius.

The presence of deep reflexes on one side and their complete absence on the other was clear evidence of spinal cord morbidity, as was the radicular pain around her body in the same area in which there was a "scalding" increase of normal skin sensation.

COMMENT

Experimental and clinical studies have tried to determine the causes of neural symptoms after spinal anesthesia. Some of these are (1) technic, particularly in the lumbar puncture;[10] (2) infection;[7] (3) the chemotoxic effect of the anesthetic agent. Septic and aseptic meningitis[11] and even death[12] have been reported following diagnostic lumbar puncture, but complications after spinal anesthesia differ in kind and strength. So the introduction of a needle into the lumbar subarachnoid space would not seem to be the injurious factor in spinal anesthesia. Lundy,[13] by a series of well controlled experiments on dogs, has made this clear.

Infection by an unknown organism has been insinuated by some investigators.[7] This, they thought, might explain the "incubation" period prior to the onset of symptoms following spinal anesthesia. Of course, this might be possible. In one series[14] in which 11 of 96 patients operated on under spinal anesthesia developed septic meningitis, frank infection was the underlying factor.

The evidence for a chemotoxic effect of the anesthesia is ample. The investigations of Spielmeyer[15] and Wassidlo[16] as early as 1908 and Davis[17] more recently have shown that in experimental animals the commonly used spinal anesthetic agents, when injected into the spinal subarachnoid space, produced (1) constant but varying degrees of leptomeningitis, (2) passive congestion of the ganglion cells of the gray matter, (3) swelling and fragmentation of the axis cylinders and (4) degenerative changes in the fiber tracts of the spinal cord. Burford,[18] in his study on human tolerance for procaine, says that there is a tendency of the anesthetic agent to affinity for the immediately adjacent elements at the cord surface and within the cord structure itself. This gives rise to a picture like combined tract degeneration. Oddly enough, the leptomeningeal reaction stressed by Davis is not described by Burford.

Preexisting disease of the central nervous system has been shown to be a definite contraindication to spinal anesthesia.[5] It is felt that the chemotoxic effect of the anesthetic agent aggravates the pathologic process; there is therefore need of careful neurologic examination of every patient before spinal anesthesia. Brock[19]

10. Hurxthal, L. M.: Sterile Meningitis Following Lumbar Puncture, J. A. M. A. **100**: 1489 (May 13) 1933. Reynolds and Wilson,[11] Hammer.[12]
11. Reynolds, K. E., and Wilson, G.: Aseptic Meningitis Following Diagnostic Lumbar Puncture, J. A. M. A. **102**: 1460-1462 (May 5) 1934. Hurxthal.[10]
12. Hammer, F.: Case of Death from Spinal Meningitis Following Lumbar Puncture, Dermat. Wchnschr. **86**: 467 (April 7) 1928.
13. Lundy, J. A.; Essex, H. E., and Kernohan, J. W.: Experiments with Anesthetics, J. A. M. A. **101**: 1546-1550 (Nov. 11) 1933.
14. Barrie, H. J.: Meningitis Following Spinal Anesthesia, Lancet **1**: 242-243 (Feb. 22) 1941.
15. Spielmeyer, W.: Veränderungen des Nervesystems nach Stovainanästhesie, München. med. Wchnschr. **55**: 1629-1634, 1908.
16. Wassidlo, E.: Experimentelle Untersuchungen uber Veränderungen des Niss'schen granula bei der Lumbaranästhesie, Arch. f. klin. Chir. **86**: 1017-1053, 1908.
17. Davis, L.; Haven, H.; Givens, J. H., and Emmett, J.: Effects of Spinal Anesthesia on the Spinal Cord and Its Membranes, J. A. M. A. **97**: 1781-1785 (Dec. 12) 1931.
18. Burford, G. E.: Tolerance of Humans for Procaine Injected into the Subarachnoid Space, Anesthesiology **3**: 159-170 (March) 1942.
19. Brock, S.; Bell, H., and Davison, C.: Nervous Complications of Spinal Anesthesia: Clinical Study of Seven Cases and Tissue Study in One Instance, J. A. M. A. **106**: 441-447 (Feb. 8) 1936.

feels that individual sensitivity may be needed to produce these reactions to spinal anesthesia, as few patients have central nervous system complications. Of course, such theorizing may well be the explanation for every pathologic process.

Hyslop,[20] in discussing Brock's paper, mentions 0.5 per cent as the incidence of complications after spinal anesthesia in his experience but adds that many men writing on spinal anesthesia have been ignorant of, and have therefore omitted, reference to sequelae that have occurred. This has been our experience.

SUMMARY

1. Three verified cases of spinal arachnoiditis and paralysis following spinal anesthesia were encountered.

2. Many surgeons and anesthetists are unaware that these sequelae exist because they appear after the patient has been discharged by the surgeon.

3. The gravity of possible spinal arachnoiditis and subsequent paralysis must enter into the meditations of surgeons and anesthetists when determining procedure.

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THE EFFECT OF VIVAX MALARIA ON SPINAL FLUID AND BLOOD SEROLOGIC TEST FOR SYPHILIS

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It has been known for many years that infectious diseases such as malaria, yaws, upper respiratory infections and leprosy are productive of biologic false positive serologic tests for syphilis. It is our purpose in this study to determine the effect of vivax malaria on the spinal fluid and blood serologic reactions. Various investigators have reported on the incidence of false positive reactions in the blood of malarial patients. Fellows [1] stated that in 3,244 cases there was an incidence of 9.9 per cent positive serologic tests for syphilis but in only 3.1 per cent were malarial parasites demonstrated, and when parasites were discovered there was a disagreement between the first and second blood tests in 64.8 per cent of the cases. Burney, Mays and Iskrant,[2] working with inoculated malaria in nonsyphilitic patients, found that all cases gave a false positive serologic test for syphilis at some time during the fever therapy.

CASES STUDIED

These studies were carried out on a group of soldiers who had been in a malarious district for several months and had been transferred to a nonmalarious district three months prior to the beginning of this investigation. One hundred nonsyphilitic white male patients with vivax malaria, proved by finding Plasmodium vivax in smears of the peripheral blood, were studied. The range in age was from 20 to 35 years, the mean age being 26.5. All patients except for malaria and its side effects were healthy. Nine of the patients examined were having their initial attack of malaria, but the remainder had been previously hospitalized with proved cases of malaria for from one to sixteen times (table 1). From this table it will be noted that in the greatest number of cases studied there were from one to four attacks prior to the one on which this study was made. All patients were put on atabrine therapy as soon as the malarial parasite was discovered in their blood smears.

TABLE 1.—*Attacks of Malaria*

Number of Attacks of Malaria Prior to Onset of the Present Illness	Number of Patients in Each Group
0	9
1	15
2	16
3	21
4	11
5	3
6	3
7	3
8	2
9	5
10	1
11	7
14	2
16	2

METHOD OF STUDY

The patients were arbitrarily selected for this study, the only requisite being a positive blood smear for malarial parasites associated with a clinical attack. Lumbar puncture was performed and blood was taken for serologic tests from all patients within five days after the diagnosis of malaria was made. If the blood test was positive or doubtful, the patient was bled at weekly intervals thereafter until a negative test was obtained. The standard three tube Kahn flocculation test was performed on all blood specimens submitted and the spinal fluid was tested with the standard Kahn test, Pandy and cell count.

TABLE 2.—*Serologic Tests for Syphilis*

Total Number of Attacks Prior to Attack Causing Present Admission	Total Number of Patients Tested in Each Group	Number with Negative Reactions	Percentage of Group Tested	Number with Positive Reactions	Percentage of Group Tested	Number with Doubtful Reactions	Percentage of Group Tested
0	9	4	44.4	3	33.3	2	22.2
1	15	7	46.6	7	46.6	1	6.7
2	16	6	37.5	7	43.5	3	18.7
3	21	11	52.3	7	33.3	3	14.3
4	11	8	72.7	2	18.2	1	9.09
5	3	2	66.6	0	0	1	33.3
6	3	3	100.0	0	0	0	0
7	3	2	66.6	1	33.3	0	0
8	2	1	50.0	1	50.0	0	0
9	5	2	40.0	3	60.0	0	0
10	1	1	100.0	0	0	0	0
11	7	5	71.4	2	28.6	0	0
14	2	2	100.0	0	0	0	0
16	2	2	100.0	0	0	0	0

RESULTS

The spinal fluid Kahn reaction was negative in all cases tested. In 2 cases the Pandy was reported as "a trace." The cell count was within normal limits in all specimens.

The blood serologic test for syphilis was reported as positive in 33 cases, doubtful in 11 and negative in 56; therefore 44 per cent of the cases examined revealed

20. Hyslop, G. H.: Spinal Anesthesia: Nervous System Sequelae, Surg., Gynec. & Obst. **57**: 799-800 (Dec.) 1933.

The laboratory examinations in these cases were performed through the cooperation of Lieut. Col. D. J. Greiner and his staff of the 142d General Hospital.

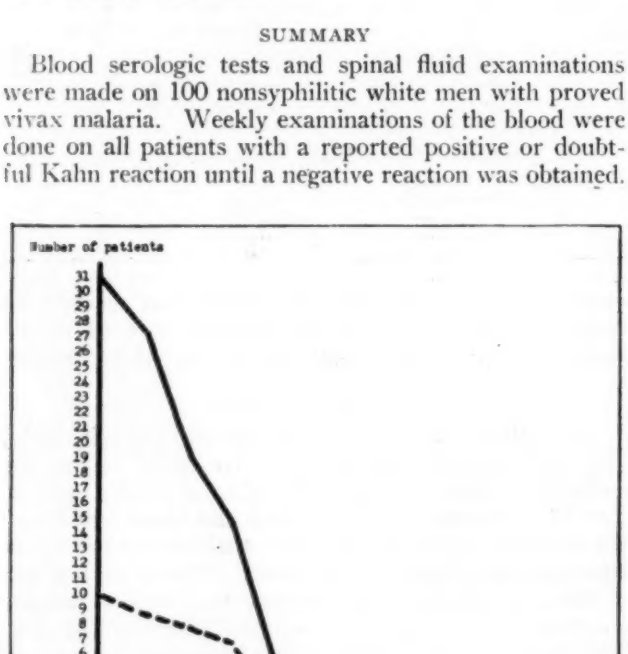
1. Fellows, F. S.: Relationship of Malaria to Serologic Tests for Syphilis, North Carolina M. J. **2**: 601 (Nov.) 1941.

2. Burney, L. E.; Mays, J. R. S., and Iskrant, A. P.: Results of Serologic Tests for Syphilis in Nonsyphilitic Persons Inoculated with Malaria, Am. J. Pub. Health **32**: 39 (Jan.) 1942.

some change in the blood Kahn reaction (table 2). The patients with negative blood reactions were not followed after discharge from the hospital. Two of the patients with positive reactions were lost from observation. Twenty-six (83.8 per cent) of the remaining cases giving positive Kahn reactions became negative after four weeks and all had become negative after ten weeks. Of the 44 patients in whom there was some change in the serologic test for syphilis, 75 per cent had negative reactions after four weeks and only 10.3 per cent still showed some change at the end of six weeks, as shown in the chart.

SUMMARY

Blood serologic tests and spinal fluid examinations were made on 100 nonsyphilitic white men with proved vivax malaria. Weekly examinations of the blood were done on all patients with a reported positive or doubtful Kahn reaction until a negative reaction was obtained.



Change in reaction. Solid line, patients with positive reactions; broken line, patients with doubtful reactions.

CONCLUSIONS

1. Vivax malaria did not produce any change in the spinal fluid Kahn reaction in any of the 100 patients in this series.

2. No elevation of the spinal fluid cell count was noted in any specimen.

3. In 2 instances the Pandy reaction was reported as "a trace."

4. Thirty-three per cent of the cases examined gave positive blood Kahn reactions and 11 per cent gave doubtful reactions.

5. There is no apparent correlation between the number of attacks of vivax malaria and the development of positive serologic reactions for syphilis.

6. Eighty-three and eight-tenths per cent of those with positive reactions had negative reactions at the end of four weeks.

7. Seventy per cent of those with doubtful reactions had negative reactions at the end of four weeks.

8. The serologic reaction for syphilis was negative in all cases at the end of eleven weeks.

TRAUMATIC VASOSPASTIC DISEASE OF THE HAND (WHITE FINGERS)

WITH PARTICULAR REFERENCE TO BIOPSY FINDINGS

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DETROIT

It has been known for some time that workers exposed to repeated percussion may develop circulatory disturbances in the hands. The condition is most frequently associated with the use of the pneumatic hammer (or jack hammer) and consequently the term "pneumatic hammer disease" is the one most commonly employed. Other synonyms are dead fingers, white fingers, traumatic vasospastic syndrome, vasospastic disease of the hands and Raynaud's phenomenon. The industries in which pneumatic tools are now employed are numerous and increasing. These industries include mining, quarrying, road making, shipbuilding, locomotive and other work shops, airplane construction and shoemaking. The tools employed are pneumatic hammers, chisels, riveters, road drills and pounding and lasting machines. The condition has also been said to occur in telephone operators.

Other conditions associated with the use of vibrating tools have been described, but they are not within the scope of this paper. These conditions include changes in muscles, bones and joints, and nerve disturbances.[1]

The first report on pneumatic hammer disease was by Loriga of Rome in 1911,[2] while the first report of the disease in this country was made by Cottingham in 1917.[3] His investigation was made at the request of the Journeymen Stone Cutters' Association on men using the pneumatic chisel in the Indiana limestone belt. At this time there was much agitation against the use of the pneumatic chisel. The United States Bureau of Labor Statistics and the United States Public Health Service intervened in the dispute. Dr. Alice Hamilton was sent to Indiana to study the problem. Her report was published in 1918.[4] From that time on sporadic reports have appeared in the literature, but none have described the clinical findings more thoroughly or completely.

The clinical pattern of traumatic vasospastic disease of the hands is almost stereotyped. After a few months to several years of exposure to the vibrations, the patient notices attacks of blanching and numbness of the fingers. The pallor is much more pronounced than in Raynaud's syncope, but it is not succeeded by the stage of extreme asphyxia so characteristic of the former. It is not symmetrical even when in both hands. In right-handed persons the little, ring, middle and more rarely the index finger of the left hand and the tips of the fingers of the right hand are usually involved. It is more common in the left than in the right hand, because the tool is held in the left hand with the cutting

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1. Sommer, R.: Fragen zur Pressluftschädigung, Zentralbl. f. Chir. **68**: 849, 1941. Copeman, W. S. C.: Arthritic Sequelae of Pneumatic Drilling, Ann. Rheumat. Dis. **2**: 141, 1940. Atlas, L. N.: Traumatic Vasospastic Dystrophy of the Extremities, Arch. Surg. **42**: 1042 (June) 1941.

2. Loriga of Rome, 1911, cited by Barker, N. W., and Hines, E. A.: Arterial Occlusion in the Hands and Fingers Associated with Repeated Occupational Trauma, Proc. Staff Meet., Mayo Clin. **19**: 345, 1944.

3. Cottingham, C. C., cited, The President's Monthly Report, Stone Cutters J. **32**: 5 (May) 1917.

4. Hamilton, Alice: A Study of Spastic Anemia in the Hands of Stonecutters, in Bull. 236, U. S. Department of Labor, Bureau of Labor Statistics, Industrial Accidents and Hygiene Series no. 19, 1918, p. 53.

edge pressed against the object. The handle of the hammer is held in the right hand. In left-handed men the condition in the two hands is reversed.

The attacks may occur while the patient is working. Usually the blanching is most pronounced early in the morning, particularly in cold weather. The attacks can be brought on by washing the hands in cold water or going outdoors for a while in cold weather. They usually come on more frequently in the winter months, when exposure to the cold is more prone to occur. Emotion does not appear to produce the attacks. Some workers have complained that if they hold their hands up for a few minutes the affected fingers grow numb. Rothstein [5] examined 8 employees using the air hammer and found a decrease in sensation of touch, pain and temperature over the affected fingers. In none of the men was this decrease of severe degree. In addition to the blanching and numbness, most patients complain of a discomfort in the hands during the attacks and for a few minutes following the attacks. In a few instances this discomfort is described as a "toothache-like" pain.

The attacks do not result in the wasting and death of tissue. The disease is not attended by the thickening of the skin as in the scleroderma which may accompany Raynaud's disease. One case of diffuse scleroderma involving the face and hands and Raynaud's phenomenon is described as developing together in a pneumatic tool worker.[6] The dorsalis pedis and the posterior tibial pulsations could not be felt. The author admits that "the vibrations may not have caused the scleroderma." Junghanns [7] describes a case of gangrene of the finger tips of the left hand in a worker who had used the air hammer for eleven years. Nodules later developed in both forearms. Microscopic studies of the blood vessels in these nodules revealed lesions similar to those found in Buerger's disease.

The disease is limited to the hands, although between attacks some workers have complained of numbness involving one half of the body.[4] A case of unilateral peripheral vascular disease occurring in the left foot in a worker using this foot to operate a pneumatic drill press has been described.[8] Gangrene of the foot developed, and the leg was amputated. Microscopic examination of the blood vessels revealed Buerger's disease.

In a study of 67 cases of white fingers in workers using the air hammer [4] the length of experience with the machine ranged from one and a half to sixteen years. The average time among those who were affected was 5.7 years. The average among the employees who reported that they had not been affected injuriously was 9.2 years.

Rieder [9] studied 250 workers who had used the air hammer up to forty years. Of these only 75 were entirely free of symptoms. Eighty-six had white fingers. Hamilton [4] found among 38 limestone cutters that there were only 4 who had never had white fingers. Out of 50 granite workers who had used the air hammer only 7 had escaped having the disorder.

When the workers stop using the pneumatic hammer, the symptoms usually improve slightly but do not disappear. According to Anderson [10] the disease may be relieved on change of occupation if it has not become chronic. Wright [11] states that rest from the regular occupation results in improvement only if the condition is early and mild. The prognosis as to complete recovery is doubtful and usually poor, although a few instances of spontaneous recovery have been reported.[4] Men who have given up the use of the air hammer for many years still have vasospasm of the affected fingers in cold weather.

The present study is concerned with the clinical findings and the microscopic findings in the capillaries and arterioles of the fingers in 6 women war workers using a pneumatic riveter in airplane construction work in Detroit. To our knowledge this is the first time that the condition has been described in women and the first time that microscopic studies of the finger tips have been done.

TABLE 1.—*Observations in Six Cases*

Case	Age	Sex	Time of Onset	Biopsy and Time After Onset	Extent of Involvement
1	25	♀	2 mo.	Yes/15 mo.	Index, long, ring and little fingers, left hand
2	23	♀	11 mo.	Yes/17 mo.	All fingers and tip of thumb, left hand
3	22	♀	11 mo.	Yes/20 mo.	All fingers and tip of thumb, left hand
4	20	♀	10 mo.	Yes/11 mo.	Index, long, ring and little fingers, left hand
5	26	♀	11 mo.	Yes/ 7 mo.	Index, long and ring fingers, left hand
6	38	♀	2½ mo.	Not done	All fingers and tip of thumb, left hand; lateral three toes, left foot; one or more toes, right foot

Typically the fingers and the tip of the thumb of the left hand are involved. Patient 6 has the typical hand involvement but also has had vasospasm of one or more toes of both feet. It is difficult to explain the lower limb vasospasm on the basis of the use of the pneumatic hammer alone, since the right hand has escaped involvement. Possibly a vasospastic diathesis may be a factor in her case. Unfortunately, no biopsy was permitted.

CASE HISTORIES

The age, sex, time of onset, time of biopsy and extent of involvement of the 6 patients are given in table 1. All patients are right handed. Since the clinical picture is almost the same in all cases with the possible exception of case 6, the description of the attacks, the progress, the temperature readings and the biopsy findings will be considered together.

Description of Attacks.—On response to cold air, particularly in the morning, attacks of vasospasm were initiated. During the spell, the involved fingers became white (fig. 1), anesthetic and painful. When the patient entered a warm place the fingers changed to bluish yellow and then to pinkish, and soon the vasospasm was followed by vasodilatation. During recovery from the attack there was a feeling of "pins and needles" and pain, described by some as a "toothache-like pain." In between spells the hands were normal. At times there would be no attacks for many days, even in cold weather. One of the patients developed vasospasm of the affected fingers in summer while holding a cold bottle of carbonated beverage. The spells were not all of equal severity; in different attacks one or more phalanges of one or more fingers were involved. In table 1 is given the maximum extent of vasospasm up to the time of the writing of this paper.

5. Rothstein, T.: Report of the Physical Findings in 8 Stonecutters from the Limestone Region of Indiana, in Bull. 236, U. S. Department of Labor, Bureau of Labor Statistics, Industrial Accidents and Hygiene Series no. 19, 1918, p. 67.
6. Leyes, D.: Diffuse Scleroderma and Raynaud's Phenomenon, Lancet **2**: 692 (Sept. 23) 1939.
7. Junghanns, H.: Blutgefässchädigungen durch Dauererschütterungen in folge Arbeit mit Pressluftwerkzeugen als Berufskrankheit, Arch. f. klin. Chir. **188**: 466, 1937.
8. Mills, J. H.: Pneumatic Hammer Disease in an Unusual Location, Northwest Med. **41**: 282, 1942.
9. Rieder, W.: Zur Frage der traumatischen Entstehung der Endangiitis obliterans, Arch. f. klin. Chir. **193**: 737, 1938.
10. Anderson, U. S.: Traumatic Disorders of the Peripheral Vascular System, Minnesota Med. **25**: 659 (Aug.) 1942.
11. Wright, Irving: Industrial Medicine and Its Relation to Peripheral Vascular Disease and Injury, Indust. Med. **9**: 463, 1940.

Neurostatus.—The texture of the skin and nails was normal in every case and the hands were moist. There was no localized atrophy in the hands. Tendon reflexes were normal. There were no sensory changes except in case 6, in which slight hypesthesia of the left index finger existed from the metacarpophalangeal joint down.

Fig. 1.—Vasospasm produced by exposure to a temperature of 35 F. (hospital refrigerator). This photograph was obtained in May 1945, the outside temperature being in the high forties. The simultaneous cooling of the body and the affected fingers is more successful in producing the vasospastic attack. When the patient left the refrigerator the fingers turned to a cherry-red in a matter of a few minutes. Note that the general appearance and contour of the skin and nails of the hand are normal.

Progress.—For the first few months following the onset of the condition only the tips of the fingers were involved. Within three to four months the vasospastic condition extended to the metacarpophalangeal joints, and in 3 cases the tip of the thumb also was affected. In case 6 the lateral three toes of the left and the second toe of the right foot underwent vasospastic spells. Although fourteen months or longer have elapsed since the patients stopped using the pneumatic hammer, the attacks of vasospasm still continue. However, all are employed and this condition has not been disabling. In conclusion, it may be said that there is some progress in the extent of involvement for the first three to four months following the onset. Thereafter the condition usually remains stationary. Three patients have complained of dull ache on exertion in the left upper limb between attacks of vasospasm.

Temperature Studies.—Temperature readings of the fingers, the toes and the upper and lower limbs were obtained on one or more occasions. Readings were taken after the patients were first exposed to a room temperature of 20 C. (68 F.) for a half hour. Later they were exposed to a room temperature of 30 C. (86 F.) for one hour and their temperatures studied. The vasomotor response was normal. The typical readings are given (table 2).

Biopsy and Pathologic Findings.—Five of the 6 patients consented to a biopsy of the finger tips. Three were obtained from the tip of the long finger and two from the tip of the ring finger of the left hand. Block procaine hydrochloride anesthesia was used. About 15 cc. of a 2 per cent solution was injected along the metacarpophalangeal articulation. The finger tip became completely anesthetized with no change in its texture from the local anesthesia. A median incision was made on the palmar surface of the last phalanx and a slice of tissue ¾ inch long and ⅛ inch wide was removed. This included the skin and the underlying connective tissue bed. The wound was approximated with two interrupted silk sutures, and healing was entirely normal in each instance.

The tissue was fixed in solution of formaldehyde and embedded in paraffin. Serial sections were made, and the tissue was stained with hematoxylin eosin. Autopsy material was obtained in the same manner and was used for control. The sections were studied carefully for changes in the capillaries, arterioles and veins. The

TABLE 2.—*Typical Temperature Readings*

	Left Hand		Right Hand	
Case 3	20 C.	30 C.	20 C.	30 C.
Thumb	18.0	30.0	18.0	30.6
1st finger	17.0	28.4	18.0	29.0
2d finger	17.0	29.0	17.8	29.0
3d finger	17.4	28.0	17.6	26.6
4th finger	17.6	27.0	17.0	28.0
Mid-inner arm	24	32	24	32
Case 6				
Thumb	19.1	29.0	18.8	29.4
1st finger	19.0	28.9	18.6	28.6
2d finger	18.8	28.0	18.0	29.0
3d finger	18.6	27.0	18.0	28.0
4th finger	18.6	29.4	18.0	28.0

capillaries appeared normal except in two sections, in which a red staining amorphous substance was noted within the capillary. Since similar changes were noted in the autopsy material, this was not considered abnormal. The larger vessels had a normal adventitial layer, the muscular coat appeared normal and the endothelial

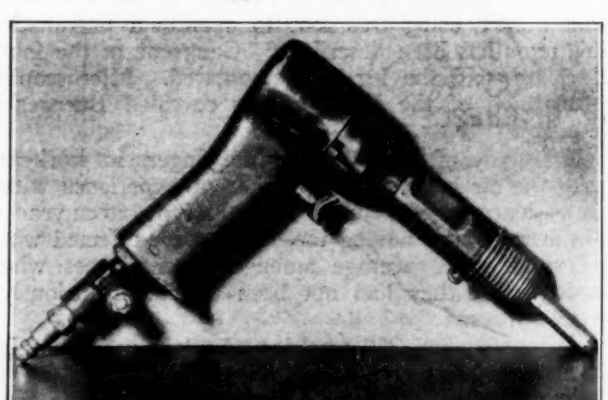

Fig. 2.—Pneumatic hammer used by our patients.

lining showed no pathologic changes in all sections studied. There were no evidences of endothelial proliferation or occlusive phenomena. There was no evidence of inflammatory reaction in any of the sections studied.

COMMENT

The pneumatic hammer used by the patients weighed 3 pounds. The riveting surface was ¼ inch in diameter and the expended pressure was 17½ pounds. The

machine struck between 3,000 and 3,400 times per minute, the most efficient rate according to the engineers. A photograph of the pneumatic hammer is shown in figure 2. The riveted object was held in place with the left hand, the latter receiving most of the imparted vibrations. The operator worked eight and three-quarter hours per day. The maximum period of continued work without rest was in the neighborhood of two hours and fifteen minutes. In the 6 cases observed, the shortest interval of time before the condition appeared was two and a half months, while the longest period was eleven months after the use of the pneumatic machine. It is interesting to note that all the employees operating this particular machine sooner or later developed vasospastic disease of the left hand.

Since these patients have come under observation, a new stationary pneumatic hammer has been perfected which does not necessitate the handling of any tools. All the operator has to do is to place the part to be riveted into the machine. By this procedure he is exposed to almost no vibrations. This stationary riveter is about four times more efficient than the one operated by hand.

The study of the cases described reveals that the encountered vasospastic disease is unilateral and in the left hand in each instance. The little finger has escaped involvement in only 1 patient. The thumb was normal in the beginning in all cases, but with the progress of the disease there was minimal involvement in 3. In 1 there was vasospasm of the lateral three toes of the left and the second toe of the right foot.

Although the patients have not used the pneumatic hammer for more than a year, attacks of vasospasm still continue. In no instance has there been evidence of bilateral involvement such as in Raynaud's disease. The texture of the hand and skin has remained normal. There have been no instances of scleroderma and no evidence of increasing lack of proper circulation to the finger tip as seen in the later stages of Raynaud's and in Buerger's disease. The condition appears to be a vasospastic disease of the fingers without organic changes in the tissues. Most of the patients have been observed for almost two years, and during this period there has been no appreciable increase in the severity of the condition after the first few months.

In these cases the vasospasm lasts for a short time, frequently disappearing a few minutes after the patients enter a warm building. During the attack there is anesthesia of the affected fingers, and the limb is painful. During the period of recovery most patients complain of a feeling of "pins and needles" and pain for several minutes. The color of the affected parts changes from a cadaveric white to a cherry-red and then to normal within a matter of minutes.

A study of the temperature ranges of the upper limbs revealed satisfactory vasomotor response, which is different from the condition seen in late Raynaud's disease or in Buerger's disease.

The microscopic study of the fingers showed no change in the structure of capillaries and arterioles. It is admitted that since we have only hematoxylin eosin preparations at our disposal, minute changes in cell structure may have been missed. However, gross occlusive phenomena, proliferating intimal changes and inflammatory reaction were not seen. In this respect the condition is similar to the findings in early Raynaud's disease but unlike the findings in Buerger's disease.

The mechanism of the production of this disorder is difficult to explain. Hamilton [4] considered the low temperature of the workshop as being significant in her study of stone cutters. In our cases the operators worked in room temperatures of 72 to 78 F., so that the importance of low temperatures in the production of the disease is to be discounted.

Although low temperatures are not necessary to cause the disease, they do initiate the attacks once the condition has been established. In the study of our material we have repeatedly noted that cooling of the entire body helps to cause the vasospasm rather than the mere local cooling of the affected hand.

The other factor pointed out by Hamilton [4] was the anemia of the hand from holding the pneumatic hammer too tightly. This may be important.

The third possibility is injury to myoneural junctions of arterioles in the fingers, disturbing fine mechanisms of chemical adjustment, with resultant loss of vasomotor control. In the study of our cases we have been repeatedly impressed by the fact that in the diseased fingers exposure to cold causes more than a normal response resulting in vasospasm and on warming the fingers there is again more than a normal response, resulting in capillary dilatation characterized by a cherry-red color of the affected parts.

The development of the condition in our cases in a relatively short time (average six to eight months) may be due to the fact that primary vasospastic disease of the extremities is more common in the female. In Hamilton's study an average of one and one-half to five years elapsed between the beginning of the use of the pneumatic hammer and the appearance of the disease.

Our patients have not received special forms of treatment such as sympathetic block or sympathectomy, because such treatment was refused and also because their handicap did not seem to warrant radical means of therapy. It is hoped that in the near future we may be able to study the effect of thoracic sympathectomy on the course of this disease in some cases. From time to time diathermy and heat treatments and iontophoresis with mecholyl have been employed with no appreciable change in their condition. In this connection it may be pointed out again that some patients with traumatic vasospastic disease have worked for as long as twenty years following the onset of the condition with no appreciable increase in the severity of the symptoms. Others have gone into other occupations and have had recurring attacks of vasospasm in the affected limb for as long as sixteen years after the discontinuance of the use of the pneumatic hammer.[4]

From the study of our cases and of the cases described in the literature certain factors in the prevention of this disorder are evident. If the object to be riveted or hammered is held in one hand and the hammer is operated with the other hand, the hand holding the object will be affected. Therefore, mechanical devices to hold the object are most desirable. Other mechanical devices for holding the tool of the hammer, instead of by hand, would prevent the development of the disorder in the hand used to guide and steady the tool. This is important in stonecutting and allied occupations. Other factors which may be important in the prevention of the disorder or further development of the disease are adequate periods of rest from the use of the hammer and early recognition of the disorder and immediate discontinuance of the use of the hammer in these cases.

CONCLUSIONS

1. In 6 cases of traumatic vasospastic disease of the hand no demonstrable organic change in the capillaries and arterioles of the finger tip has been demonstrated in biopsy studies. In this respect the condition is similar to the pregangrenous stage of Raynaud's disease.

2. The appearance of the disease in much shorter time than has been reported in the literature in male patients, and also because all patients thus employed developed the condition, suggests that traumatic vasospastic disease may be more prevalent in the female than in the male.

3. The clinical course of our patients is characterized by attacks of benign vasospasm with little increase in severity over a period of two and a half years' study. However, the discontinuance of the use of the pneumatic hammer has not resulted in a single case of relief.

4. The manner of operation of the pneumatic hammer is important in the prevention of this disorder.

ABSTRACT OF DISCUSSION

DR. GEZA DE TAKATS, Chicago: When the delicate neurovascular mechanism of the human hand is subjected to a vibration rate of 3,000 or more a minute a group of phenomena may occur which roughly fall into two patterns. The authors' excellent description of the digital vasospasm initiated by cold, producing no structural changes and lasting for many years, requires no further discussion. The fact that histologic changes in the blood vessels were absent is very significant, since the primary lesion seems to be elsewhere. During the last year I examined another type of patients who had used a small rotary air-driven tool, weighing about 1½ pounds, with a vibration rate of 12,000 revolutions a minute. The amplitude of vibration was one to three thousandths of an inch, and there was considerable exposure to cold air. Such patients, while sensitive to cold and while showing some evidence of capillary stasis, primarily exhibited a peripheral neuritis of ulnar or median distribution. Their hands, which had been alternately splinted or massaged for the relief of pain, showed the glossy skin, the atrophic musculature, the contracted tendons, the stiff joints and the osteoporosis of the causalgic state. The pain was of a burning character, ascending in type, frequently aggravated or confused by superimposed hysterical anesthesia and anxiety neurosis. Whether this type of hand, because of the higher vibration rate, is simply a more advanced form of the vasospastic hand is impossible to state with certainty. It is more than likely that all these vibrating tools produce a percussion neuritis. I have not yet had the courage to obtain a biopsy of a peripheral nerve from such a hand. Everything we know of the causalgic state would indicate that such a biopsy would aggravate the patient's symptoms. However, the study of Denny-Brown's experiments with a single percussion of a nerve trunk (*J. Neurol. & Neurosurg.* **7**:76, 1944) indicates that the myelin sheath and the Schwann sheath easily rupture; that the damaged myelin escapes into the endoneural space and sets up an irritation. Such an internal disorganization of a mixed nerve is the underlying histologic picture of causalgia, with its incoordination of circulation (de Takats, Geza: Causalgic States in Peace and War, THE JOURNAL, July 7, 1945, p. 699). Repeated sympathetic blocks have been done on these patients and have helped the vasomotor and the pain phenomena. Often, however, the previous splinting has produced intractable contractures. A defiant attitude develops. It is important then to treat such patients with the utmost urgency, since pain will prevent movement and produces protective muscle spasm. The question is raised whether patients with a high vascular tone are more vulnerable to air-hammer disease. This could be worked out with a suitable test (Naide, Meyer: *Am. J. M. Sc.* **207**:606 [May] 1944). Clinically a cold, sweaty hand is often seen in such patients. It is not surprising that a patient with severe diabetic neuropathy in other extremities exhibited the most severe air-hammer hand I have seen, since she already had a widespread demyelinizing process. There may be other contributing factors to this percussion neuritis, but one should repeat the authors' excellent suggestion that it should be possible to eliminate this tool entirely. In many ways this type of nerve injury is more difficult to repair, since damaged myelin and the naked axon cylinders poorly insulated from each other set up long-lasting irritative phenomena.

HERNIAS AND SERIOUS INJURIES IN MARITIME COMMISSION SHIPYARDS

WITH REFERENCE TO PREPLACEMENT EXAMINATIONS

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Shipyards working under contracts for the United States Maritime Commission employed, during the war emergency period, about one million persons in yards located on the perimeter of the United States. Soon after the true magnitude of the shipbuilding program became apparent the Maritime Commission and the United States Navy, realizing the need to increase production, adopted a set of "Minimum Requirements for Safety and Industrial Health in Contract Shipyards."[1] These requirements were designed to conserve manpower and promote the physical welfare, health and safety of employees. One of the basic precepts was the mandatory establishment of preplacement physical examination procedures in each of these contract shipyards (par. H-6.1, ref. 1). Consequently all shipyards of the Gulf and East Coast regions and some of those in the Great Lakes region which had not previously required such examinations developed necessary facilities and plans to include them in their employment procedure. Shipyards operating on the West Coast, however, have not complied with the requirement.

The Pacific Coast "Master Labor Agreement" between the American Federation of Labor and the Pacific Coast shipbuilders, section 11, states in part "There shall be no doctor's physical examinations nor age limits, except as required by law." Negotiations to amend this clause have been continued by the contractors, but labor remains adamant in its attitude. Therefore no employment examinations of any type have been made on any employees of West Coast Maritime Commission shipyards.

There is thus presented, within the Maritime Commission's jurisdiction, an unusual opportunity to compare the results of preplacement physical examinations performed on about 100,000 men and women over a period of three to four years, with a similar group in the same industry which has not been subjected to

This constitutes part of a thesis prepared at Harvard School of Public Health for Master of Public Health degree.

Professor Philip Drinker, chief health consultant, United States Maritime Commission, was of considerable assistance in completing the study.

Dr. McGill formerly was assistant chief health consultant, United States Navy—Maritime Commission Contract Shipyards, Gulf Coast Region.

The opinions expressed are those of the author and do not necessarily conform to those of the United States Public Health Service or the United States Maritime Commission.

Mr. Howard Gates, chief, Casualty Insurance Section, Division of Insurance, United States Maritime Commission, was of invaluable help in furnishing the compensation carriers' reports from which the data were obtained.

1. Minimum Requirements for Safety and Industrial Health in Contract Shipyards, U. S. Navy, U. S. Maritime Commission, Washington, D. C., Government Printing Office, 1943.

examinations. It is unlikely that a comparable group of data has been previously available.

Absolute necessity has forced the shipbuilding industry to employ the physically handicapped or imperfect and to place much emphasis on maximum utilization of man and woman power through the elimination of lost time due to preventable causes. The industrial safety program has resulted in substantial savings through protection from industrial accidents and diseases, but the Maritime Commission officials realized that an important basis for the control of both occupational and nonoccupational illness and injury is the effective utilization of physical examinations. To activate such a program they adopted the newer philosophy of preplacement examinations and accepted as a working basis the specific objectives of such examinations, as outlined by the Council on Industrial Health of the American Medical Association,[2] which are:

1. To facilitate placement and advancement of workers in accordance with individual physical and mental fitness.
2. To acquaint the worker with his physical status and to advise him in improving and maintaining personal health.
3. To safeguard the health and safety of others.
4. To discover and control the effects of unhealthful exposure.
5. To promote cooperative support and understanding of industrial health practices by employer and employee alike.

The examination procedures may not have fully achieved these broad ideals, but most of the yards doing preplacement examinations have had as a prime objective the fitting of every worker to the type and quality of work according to his or her ability to perform such work continuously, without undue impairment to self or fellow workers. Numerous wartime exigencies have presented obstacles to the fullest realization of the potential benefits.

EXAMINATION PROCEDURE

The steps in the employment procedure, as generally practiced, are as follows: The applicant is first given a preliminary interview by the employment department to determine his general qualifications for work. He is then referred to the medical department for examination and classification, after which he is sent back to the employment department for hiring and placement within his physical capacity, or rejection. If rejected, the considerable expense and time of completing employment, including finger printing, photographing and issuing a badge, are thus eliminated.

The examination usually includes a brief medical and personal history signed by the patient. Considerable variation exists in the thoroughness with which this is done, but a nonmedical clerk usually spends two to four minutes obtaining the data. The record of height, weight, blood pressure, pulse rate, hearing and visual acuity, temperature and the like is usually made by a trained assistant or a nurse in about ten minutes for each worker.

When the preliminary tests are concluded, the applicants are examined by the yard physician. The men are usually examined, stripped, singly or in groups, special search being made for hernias, varicosities, deformities and cardiovascular or neuropsychiatric defects. Examinations of women are usually not so complete as indicated for the men. Examinations have not always been performed in the most desirable manner, sometimes being little more than medical inspections, especially when one physician, with his nursing and clerical helpers, is required to examine up to 160 workers daily. Placement following the examinations has not always been ideally practiced, but in all yards some effort has been made in this direction.

From the examination data the physician classifies the applicant in accordance with the system generally adopted by industry:

A. Fit for any work in the yard.

B. Physically underdeveloped or with correctible defect; otherwise fit for any work, or capable of all but specifically excepted jobs.

C. Fit only for certain jobs when approved and supervised by the medical or safety department.

D. Physically unfit for any work in the yard.

The rejection rate, or proportion of those classified D, has averaged less than 3 per cent. This is an indication of the liberal physical standards used and of the general success of the practice of preplacement physical assessments. The National Association of Manufacturers[3] states that the average rejection rate of 1,154 plants in 1939 was 4.4 per cent. This rejection rate was before 11,000,000 younger men were inducted into the armed forces, leaving a larger proportion of persons physically defective to be hired by industry. In personal communications from other large industrial groups, I am informed that their present rejection rates are somewhat higher than the 3 per cent now experienced in the Maritime Commission yards.

GEOGRAPHIC DISTRIBUTION

Of the ten shipyards considered in this study, five, located on the East and Gulf coasts, required preplacement examinations. The other five, on the Gulf and West coasts, which did not require examinations, are henceforth considered as the control yards. Comparison of these similar sized groups of workers must necessarily be on an arbitrary basis. The innumerable personal and socioeconomic factors influencing two groups of people in such different geographic areas cannot be statistically evaluated.

Four of the yards doing examinations and two in the control group are located in the Southern states. For many years it has been generally believed that this geographic area is below the median level of the United States in many of the important socioeconomic classifications. It is known that this same area presents an unusually high incidence of many diseases, especially dietary deficiencies, venereal diseases, parasitic diseases and tuberculosis. Medical care facilities also are known to be insufficient. These are mentioned to indicate some of the factors that might possibly influence the results on which this study is based. It is generally believed that a lowered physical well-being increases accident proneness. If the Southern, and to a lesser extent the Eastern, shipyards have employees of lower physical status than that of the Western yards, they may be expected to have more serious accident claims, including hernias, presented for compensation adjustment, other in-plant safety and health hazards being equal.

EFFECTS OF EXAMINATIONS ON COMPENSATION INSURANCE RECORDS

The accident frequency records, as listed in table 1, for each yard under consideration for the period 1943-1944, were taken from reports compiled by the Division of Industrial Hazards, United States Department of

2. Industrial Health Examinations, J. A. M. A. **125**: 569 (June 24) 1944.

3. A Report of Survey of 2,064 Industrial Establishments, New York, National Association of Manufacturers, 1941.

Labor, from monthly reports furnished them by the individual yards. The "Minimum Requirements," [1] paragraph 4.13, b, defines accident frequency as

$$\frac{\text{Number of Disabling Injuries} \times 1{,}000{,}000}{\text{Total Man Hours Worked for Period Covered.}}$$

A disabling injury is one which results in a person being unable to report for work on the next regular shift or subsequent to the initial return to work. The yards without examinations more nearly group about their two year mean frequency rate (21.8) than do the examination yards about their mean rate (23.9), although the difference is not significant.

TABLE 1.—*Accident Frequency Rates,* 1943-1944*

Date	Examination Yards					Control Yards				
1943	1†	2‡	3†	4†	5†	6§	7§	8†	9§	10†
January	24.4	26.9	21.8	71.4	27.4	45.3	21.3	65.6	36.8	28.9
Febuary	20.5	27.0	12.4	56.9	40.7	45.0	19.8	50.7	28.5	26.9
March	18.8	36.7	20.8	59.2	56.6	44.0	20.9	41.2	26.9	24.9
April	19.7	32.6	15.6	84.5	28.9	30.9	22.2	35.1	25.6	24.4
May	15.5	39.3	15.9	75.3	52.4	30.7	19.4	31.4	31.4	32.0
June	15.6	47.0	21.6	64.7	54.4	28.6	18.2	31.6	20.4	34.6
July	17.0	42.5	19.6	62.3	34.1	24.5	20.5	22.1	29.2	35.6
August	18.2	50.2	17.9	62.2	24.3	22.8	21.1	24.5	49.6	29.8
September	16.4	40.6	20.2	47.4	23.1	19.8	19.0	17.4	30.1	32.3
October	14.3	35.9	11.1	50.6	27.9	18.4	19.4	24.4	25.6	31.4
November	16.3	27.7	14.1	33.1	22.3	16.6	20.0	23.2	24.3	26.9
December	10.3	33.4	9.2	31.7	21.1	12.4	18.0	23.0	16.0	24.6
Annual	17.	36.8	16.4	60.5	33.5	28.8	20.0	32.8	27.0	30.1
1944										
January	8.6	34.2	8.9	39.3	21.4	11.8	20.0	22.6	20.6	31.1
Febuary	10.8	26.4	8.7	44.3	11.4	10.7	24.0	18.5	21.0	35.5
March	11.4	16.8	3.6	38.6	1.2	9.1	17.3	20.2	19.8	36.7
April	10.5	23.9	2.8	40.3	10.6	7.1	23.1	26.8	27.8	31.4
May	10.3	30.4	9.0	42.9	18.2	9.6	17.0	20.0	30.7	31.1
June	12.2	34.5	11.1	56.3	12.9	7.7	14.2	31.6	25.2	16.3
July	7.7	30.9	8.3	63.1	17.2	6.9	10.4	16.7	29.3	15.1
August	11.6	35.0	12.0	61.1	22.4	7.5	14.0	20.3	26.5	16.7
Sep'ember	9.6	31.3	7.9	27.3	21.7	7.0	15.9	18.5	27.1	15.3
October	7.0	....	4.7	29.0	17.9	8.2	15.2	23.3	35.6	13.9
November	9.8	3.6	5.3	24.7	1.5	8.3	15.1	20.1	....	12.7
December	10.8	30.7	6.1	12.2	14.7	7.3	11.3	18.0	26.0	13.1
Annual	9.9	33.8	7.5	41.5	15.4	8.4	16.1	21.9	26.3	22.2

* Bureau of Labor Statistics quarterly tabulation from monthly reports from yards.
† Gulf Coast.
‡ East Coast.
§ West Coast.

TABLE 2.—*United States Maritime Commission Quarterly Reports, Loss Ratios (Cumulative)*

Number of Yard / Examination	1st quarter	2d quarter	3d quarter	4th quarter	5th quarter	6th quarter	7th quarter	8th quarter	9th quarter	Average
1	22.0	44.30	23.65	27.13	31.40	30.04	29.46	32.71	34.94	30.63
2	30.7	28.31	29.07	29.87	26.07	36.94	38.59	41.51	41.51	34.73
3	20.0	24.25	19.19	20.17	27.69	26.39	31.52	31.94	35.53	26.06
4	58.5	20.22	24.36	28.91	38.04	37.93	38.07	36.71	36.30	35.45
5	12.2	23.69	25.97	40.32	42.28	37.66	40.49	40.40	40.69	33.74
									Mean	32.12±1.73
									Standard deviation	3.94
Control										
6	39.6	29.54	30.32	45.91	47.40	45.25	46.29	44.40	44.17	41.43
7	....	36.24	35.19	34.06	39.36	40.39	50.17	43.99	40.98	40.12
8	41.2	37.24	27.88	28.93	32.01	31.93	32.75	34.38	39.52	33.98
9	52.5	63.63	72.92	69.43	68.61	87.9	82.81	77.69	69.58	71.57
10	30.0	34.42	36.81	46.30	59.88	63.43	61.67	60.76	69.50	52.98
									Mean	48.01±5.92
									Standard deviation	13.2

1st quarter—10/1/42 to 12/31/42
2d quarter—10/1/42 to 3/31/43
3d quarter—10/1/42 to 6/30/43
4th quarter—10/1/42 to 9/30/43
5th quarter—10/1/42 to 12/31/43
6th quarter—10/1/42 to 3/31/44
7th quarter—10/1/42 to 9/30/44
8th quarter—10/1/42 to 9/30/44
9th quarter—10/1/42 to 12/31/44

Table 2 shows the quarterly loss ratios as furnished by the Casualty Insurance section of the Division of Insurance of Maritime Commission. This is the ratio that the total amount of incurred expenses (which includes incurred indemnity and medical losses) bears to the total compensation insurance premiums. The total incurred losses and expenses include serious and nonserious open and closed claims and contract medical costs. However, incurred indemnity losses vary considerably with the workmen's compensation laws and regulations of each state.

These loss ratios are used by compensation insurance companies to measure the efficiency of the preventive and corrective medical programs of the yards. Other factors being equal, a high loss ratio indicates more numerous and more serious accidents and costlier medical treatment. The employer is interested in the loss ratio as an indication of the protection provided and of the quality of medical service given his employees. The employee also is concerned in the loss ratio, as it reflects the protection and service afforded him by the industrial safety program and medical department. If preplacement examinations are of value in protecting the worker, such protection should result in a lowered insurance loss ratio.

TABLE 3.—*Range of Total Compensation Costs;* Serious Cases†*

Location of Yards	Deaths		Hernias		Eye Injuries		Other Injuries	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Alabama	$2,145x	$5,700x	$399	$410	$310	$453	$304	$1,459
California	630	4,150	392	916	325	3,246	305	7,761
Florida	637	6,000	300	353	301	767	300	3,536
Georgia	651	2,425	303	486	414	909	300	3,778
Maryland	503	8,000	290	707	307	3,182	300	5,142
North Carolina	5,587	5,765	313	413x	325x	421	306	1,479
Texas	557	6,350	325	900	300	3,540	300	5,287

* Range of total incurred indemnity and medical losses, closed claims (except as indicated x) from compensation carriers' quarterly reports.
† Serious cases are those of over $300 total cost.

Comparison of the loss ratios (table 2) for both groups of yards shows this to be true. For the nine quarterly periods Oct. 1, 1942 to Jan. 1, 1945 the examination yards range from a low of 12.2 to a high of 58.5. The averages of these five yards vary from 26.06 to 35.4, with a mean of 32.12. For the same quarterly period the loss ratios of the control yards range from 28.9 to 82.8. The averages of these yards vary from 33.9 to 71.6, with a mean of 48.01. It is statistically significant that the control group mean loss ratio is 50 per cent higher than that of the examination yards.

Variation in compensation costs is demonstrated by table 3, which shows the range of totals of incurred indemnity and medical losses, closed claims, in various states as reported in the compensation carriers' quarterly reports to the Maritime Commission. It will be noted that considerable variation exists between the minimum and maximum costs of closed compensation claims for death, serious eye injuries and other serious accidents. The range for hernias is not so great. As cases costing $300 or more are reported as serious, the minimum figures are limited to items above this sum. These variations result from the different application of differing workmen's compensation laws by the respective state commissions. This makes it impossible to compare the yards on the basis of total compensation

expenses but does not preclude utilization of the total number of claims for serious injuries.

A principal item of importance in any tabulation of compensation losses is the frequency of hernias, especially inguinal. The occurrence of hernias included in the total incurred losses and expenses and the total number of serious closed compensation cases have been tabulated from the compensation insurance companies' quarterly report. To make these results comparable, an average of serious cases and hernias per month, reduced to a ratio per thousand employees, is presented for each yard.

$$\frac{\text{Hernias (or serious cases)} \times 1{,}000}{\text{Number of months} \times \text{average monthly employment}} = \text{Hernias (or serious cases) per thousand employees per month.}$$

The comparisons have been standardized by using employment figures available in the Maritime Commission Division of Shipyard Labor Relations up to January 1945.

These data are listed for both groups of yards in table 4, and ratios are compared in the graph. The total control group of 106,238 average employment had an average of 4.33 hernias and 35.10 serious cases per month, with a ratio of 0.21 hernias and 1.69 serious cases per thousand men monthly. The group of yards doing examinations, with an average employment of 107,921 per month, had an average of 1.47 hernias and 12.87 serious cases per month, with a ratio of 0.06 hernias and 0.58 serious cases per thousand men monthly. The ratio for hernias is over three times as high and for serious cases almost three times as high in the control yards as in the examination yards, indicating a considerable reduction of these two common and expensive items of compensation costs in the yards requiring examinations.

TABLE 4.—*Ratios of Hernias and Serious Cases per Thousand Men per Month*

Five Shipyards Performing Employment Examinations
Five Shipyards Not Performing Employment Examinations *
1941-1944

Number of Yard	No. of Mos.	Average Men/ Mo.	Hernias			Serious Cases		
			No.	Aver./ Mo.	Ratio†	No.	Aver./ Mo.	Ratio†
Examination								
1	30	21,955	92	2.36	0.11	416	10.67	0.49
2	33	42,837	97	2.94	0.07	940	29.59	0.69
3	33	13,259	13	0.39	0.03	198	6.00	0.46
4	36	16,244	41	1.14	0.07	227	6.31	0.39
5	33	13,646	17	0.52	0.04	395	11.97	0.88
Subtotal		107,921	260			2,206		
Subaverage	34.8		52	1.47	0.06	441	12.87	0.58
Control *								
6	24	38,216	135	5.62	0.14	1,365	56.88	1.49
7	24	18,459	134	5.58	0.30	825	34.38	1.86
8	21	20,190	122	5.81	0.29	549	24.05	1.14
9	16	15,905	38	2.38	0.15	739	46.19	2.90
10	27	13,468	61	2.26	0.17	379	14.04	1.04
Subtotal		106,238	490			3,837		
Subaverage	22.4		98	4.33	0.21	767	35.10	1.69
Total		214,159	710			6,043		

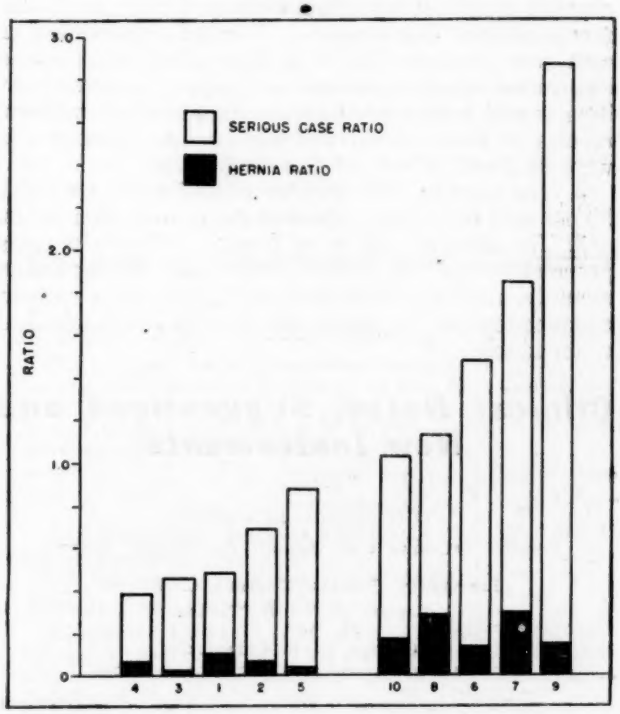
* Controls are yards without examinations.

† Ratio = $\frac{\text{hernias (or serious cases)} \times 1{,}000}{\text{months} \times \text{average men per month}}$ = per 1,000 men per mo.

Special attention is directed to the comparison of yards 3 and 10. These yards, a few hundred miles apart in different states, are as nearly alike as any under Maritime Commission control. The two are operated by the same company. Both are located in shipbuilding communities; socioeconomic factors are comparable. Workers are drawn from the same geographic areas. For the purpose of this study they are identical except for their medical programs.

Yard 3 developed a medical program, including preplacement examinations, during construction of the yard and has continued to expand the medical activities with full cooperation of the management. By contrast, full cooperation of management of yard 10 was not extended the medical department until the ship construction program was well under way. As a result, the medical activities were not permitted to develop to maximum usefulness. The results of this antithesis are clearly shown in analysis of data of table 4.

Yard 3 had an average of 0.39 hernia and 6.00 serious cases per month, ratios of 0.03 and 0.46 respectively, per thousand men monthly. Yard 10 had an average of 2.26 hernias and 14.04 serious cases per month, ratios of 0.17 and 1.04 respectively per thousand men monthly. Hernias were thus over five times (5.7) as frequent and serious cases over two times (2.3) as frequent in yard 10 as in yard 3. Loss ratios (table 2) at the former yard range steadily upward from 30 to 69.59; at the latter this increase is from 20 to 33.53—from 50 per cent to 100 per cent less than the sister yard which did not perform preplacement physical examinations. These loss ratios reflect the expenses of compensation insurance payments and are thus an expression of the working health of the shipyard employees.



Ratios, hernias and serious cases. Numbers refer to listing of yards of table 4.

Yard 5 had the next lowest hernia ratio, 0.04, and the highest serious case ratio, 0.88, of any examination yard. These are much lower than ratios at yard 10 in the same state, indicating that the difference between yards 3 and 10 was not due exclusively to any differences between the respective state compensation commission policies. Similarly, the differences between yards 5 and

10 are not due to varying compensation practices but to in-plant factors.

Further comparison with the accident frequency rates for yards 3 and 10 (table 1) shows the former to be significantly lower than the latter, with 1943 annual rates of 16.4 and 30.1 respectively. The monthly rates for 1944 show this difference to be continuous, 7.5 and 22.2 respectively.

It is not presumed that physical examinations or even the medical programs are exclusively responsible for the contrast between these two groups. However, it cannot be denied that the more complete medical programs of the examination yards contributed to their lower loss ratios and to their more favorable experience with hernias and serious cases, even though the completeness of these programs may have differed only by the examinations.

SUMMARY

1. Five shipyards which conducted preplacement physical examinations were compared with a similar group without examinations. Average employment of each group exceeded 100,000. Compensation insurance loss ratios, frequency rates and actual occurrence of hernias and severe cases in the compensation carriers' reports of losses incurred during a three year period were used as the basis of this comparison.

2. The average loss ratios for control yards are about 50 per cent higher than those of the examination yards.

3. The average number of hernias and serious cases per month, and the rate of these per thousand men monthly, are about three times as high in yards without examinations as in yards with preplacement physical examinations.

Clinical Notes, Suggestions and New Instruments

THE CRUSH SYNDROME

REPORT OF FATAL CASE WITHOUT COMPRESSION INJURY

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The crush syndrome, also known as compression syndrome with traumatic edema, has been described in British and American literature since 1940. The Medical Research Council of Great Britain has collected data on 100 cases. The typical case is fairly clearcut, and its differential diagnosis is not usually difficult. A patient is admitted with a history of compression injury, usually of an extremity. Definite absence of shock with pronounced hemoconcentration is present.

The pathologic physiology is somewhat better understood than the knowledge of the shock syndrome itself. Often the syndrome follows an initial shock picture. The usual sequence of events is as follows:

Following the recovery from the shock picture, there is a gradual diminution in the urinary output. The urine will be tinted and contain some red blood cells and also a sediment which is almost diagnostic of the syndrome. This sediment, if carefully examined spectroscopically, will prove to be myohemoglobin. The patient's blood pressure is well maintained, a moderate anemia may manifest itself and a progressive azotemia is noted. A reevaluation and history of these patients may reveal a story of prolonged compression of an extremity, the thorax or the abdomen itself. If an extremity has been compressed, it will be noted that the victim, once comfortable after the control of shock and proper control of bleeding, will react after the removal of the constricting tourniquet. The part will swell and the blood pressure will tend to fall, although temporarily maintained by vasoconstriction. Hemoconcentration and oligemia may set in because of loss of plasma into the swollen tissues. Increased tissue tension may partially obliterate the pulse, and the part may become cold.

In some patients, pressure damage may be manifested by discoloration and vesication. In still others the objective signs of injury may be concealed. Damage to some of the abdominal contents may require extensive operative surgery and resection. The patient reacts favorably and may be well on the way to recovery. From a few hours to several days after the initial treatment the urine becomes cloudy and a brown sediment forms. A spectroscopic analysis of this sediment will show it to be myohemoglobin. Further studies will demonstrate pigment casts which are at first hollow tubes and later covered by epithelial cells. Other urinary findings include a progressive increase in potassium and creatinine, most of these products resulting from degeneration of muscle tissue. Blood studies reflect a renal failure. Nitrogenous retention becomes progressive and the carbon dioxide combining power is low at first but rises thereafter. A terminal fall in blood pressure may result from the retention of acids derived from the damaged tissue.

According to Bywaters,[1] one third of the cases go on to spontaneous recovery and suggest a moderate degree of muscle damage. The disturbance of urinary functions and blood chemistry reverses itself with or without any therapy. In severe cases, however, sometimes as late as the sixth or seventh day, renal function fails and azotemia and urea will supervene.

The gross and microscopic pictures of the kidneys are quite characteristic. Grossly the kidneys are large, pale and swollen. The capsules are tense. The microscopic picture shows local areas of tubular necrosis and pigmentary casts about the loops of Henle, the distal convolutions and the collecting tubules. The pigments were found by Bywaters, Delory and Remington to have specific spectroscopic characteristics of an intracellular hemin compound which is responsible for oxygen storage in the muscles. This substance, which is much lighter than hemoglobin, is easily filtered through the glomeruli but tends to precipitate in the excretory tubules.

Changes in muscles may be either macroscopic or microscopic. Grossly the muscles may appear to be normal, but microscopic examination shows varying degrees of patchy microscopic damage. In serious damage the muscle will be swollen, pale, friable, hemorrhagic and sharply demarcated from the surrounding normal tissues. The microscopic appearance may show all the changes from edema and loss of cross striations to complete necrosis. Similar damage to that just described may occur following accidents in which arterial injuries result in arterial spasms and no apparent gross tissue damage. The therapy of this curious syndrome is similar to that utilized in prevention of urinary failure following the transfusion reaction or the use of sulfonamides. The chief objective is to maintain an adequate alkaline urinary output. This should be done, if possible, before the release of the tourniquet. If renal failure ensues, all therapeutic efforts usually fail, although some patients have been known to recover with urea levels of approximately 500.

This case is presented because of its unusual clinical course, the delay of manifestation of urinary failure, the absence of external evidence of compression and rather typical pathologic pictures of muscle and kidney damage. The patient, a healthy white infantry soldier aged 21, was admitted to the hospital after being thrown from a jeep while on a field problem and sustaining a severe blow to the abdomen, back and right arm. He was in evident shock, with a pulse rate of 120 and blood pressure of 80/60. He was pale, his skin was clammy and he complained of pain in the right shoulder and right side of the neck. Moderate abdominal tenderness and rigidity, with dulness in both flanks, were present. There was diminished peristalsis. Significant laboratory findings at the time of his admission were red blood cells 4,430,000, hemoglobin 90 per cent, white blood cells 18,000, with 83 per cent neutrophils and 17 per cent lymphocytes. The urine was essentially normal. X-ray examinations

1. Bywaters, E. G. L.: Ischemic Muscle Necrosis, J. A. M. A. 124: 1103 (April 15) 1944.

of the abdomen revealed an indefinite increase in density in the left upper quadrant. He was matched for transfusion and, following a diagnosis of a ruptured viscus, he was given both blood and plasma. With a systolic pressure of 100, the abdomen was opened through a left rectus incision under gas-oxygen anesthesia. The entire peritoneal cavity was found to be filled with blood. It was conservatively estimated that 3 quarts of blood had been lost in the abdominal cavity. As no perforations of a viscus were found, 1,500 cc. of the abdominal blood was aspirated, citrated and given back as a transfusion. In addition, he received 1,000 cc. of blood from a compatible donor. Further inspection of the abdomen revealed a huge hematoma in the transverse colon originating from a torn middle colic artery. The entire circulation of the transverse colon and parts of the descending colon had been destroyed. The pancreas was found to be badly contused and hemorrhagic. The transverse mesocolon was ligated in sections, and the entire transverse colon and about one half of the descending colon were exteriorized. The patient's immediate postoperative condition was better than before operation. His blood pressure was 130/80 and pulse rate 100. He was started on intravenous 5 per cent glucose and saline solution and continuous gastric suction and was given 2,000 cc. of blood during the next four days. Sulfadiazine and penicillin, in divided doses, were begun. On the second postoperative day, following symptoms referable to his lungs, an x-ray revealed atelectasis of the right base. This condition responded rapidly to treatment. The exteriorized colon was removed by cautery on the third postoperative day. On the fifth postoperative day his condition was good except for moderate abdominal distention, which was easily controlled by means of a Miller-Abbott tube. His blood chemistry was normal. On this, the fifth postoperative day, his urine first became smoky. Urinalysis showed 10 to 15 red blood cells per high power field and the urinary output at this time averaged 1,200 to 1,400 cc. for the twenty-four hours. Twenty-four hours later, however, the output had dropped to approximately 120 cc. In spite of this his colostomy was functioning well, the Miller-Abbott tube had been removed and he tolerated a soft diet. Efforts were made to stimulate the excretion of urine by the use of intravenous hypertonic solutions and sodium lactate, but the output never rose higher than 200 cc. in twenty-four hours regardless of the fluid intake. The ureters were both catheterized, and this procedure was followed by a large quantity of blood in the urine On the tenth postoperative day, examination of the urine revealed creatinine 35 mg., albumin 300 mg. per hundred cubic centimeters and numerous red blood cells. On this date the nonprotein nitrogen was 33. On the eleventh postoperative day it rose to 190, creatinine 7 and on the twelfth postoperative day the urea nitrogen was 79.1 and creatinine 7.5. This increase in nitrogenous end products was progressively upward until his death on the fourteenth postoperative day. Death was preceded by the appearance of moderate pulmonary edema and edema of the extremities and trunk. The terminal phase was quite sudden and apparently due to heart failure.

At autopsy it was found that the heart, spleen and pancreas were all edematous. Moderately extensive hemorrhages were noticed beneath the mucosa of the calices and pelvis of each kidney. It was felt that this change was due to trauma during catheterizations. Grossly both kidneys were enlarged, pale and quite edematous. Section through the capsule resulted in bulging of the cortical surface. On microscopic examination a generalized edema was noticed through both kidneys, involving the greater portion of the interstitial tissue and the tubular elements. Large masses of round cells and occasional polymorphonuclear cells were present between the collecting tubules. Many loops of Henle and collecting tubules were almost completely filled with granular and homogeneous pigments which almost completely obliterated the lumens, this process being more evident in the medulla than in the cortex. The medulla contained numerous tubules which were filled with red blood cells, round cells and polymorphonuclears. Grossly both psoas muscles showed some evidence of edema but no other changes. Specific iron stains were negative. On microscopic examination all manner of transition from the normal was seen. The changes included complete necrosis of some of the muscle fibers, loss of cross and longitudinal striations in others and partial necrosis in still others. The character of the necrotic muscle also varied, some fibers appearing as amorphous masses situated between normal muscle fibers, while others consisted of masses of loose basophil staining granular pigments. Swelling of the muscular nuclei and proliferation of the endomysium was evident in adjacent intact fibers. Iron stains of the presence of hemoglobin pigments in the muscle and kidney were negative. Reticulum stains demonstrated degeneration of not only the muscle fibers themselves but of the supporting stroma.

SUMMARY

1. A soldier was thrown from a jeep. He was brought to the hospital immediately. There was no prolonged compression of an extremity.

2. Renal failure developed nine days after his injury and his operation.

3. Advanced degeneration was demonstrated in both kidneys and psoas muscles.

4. Typical cellular and obstructive lesions of the renal tubules were found.

CONCLUSION

The case presented apparently demonstrates a clinical picture of the crush syndrome in which anuria was delayed until approximately the ninth day. The failure to find necrotic or degenerative muscle on gross inspection and the subsequent finding of extensive degeneration of the psoas muscles suggest a vasospastic phenomenon with ischemic necrosis. A factor which may have contributed to the degeneration of the muscles was the presence of the overlying hematoma.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

ALLERGENIC PREPARATIONS (See New and Nonofficial Remedies, 1944, p. 35).

The following extract now stands accepted:

WYETH, INC., PHILADELPHIA

Allergenic Extract: The following extract is marketed in treatment packages of five 1 cc. size cartridge ("Tubex") vials representing graduated concentrations, namely 100, 1,000, 6,000, 20,000 and 20,000 pollen units per cubic centimeter. Also in treatment packages of five 1 cc. size cartridge ("Tubex") vials, each representing 20,000 pollen units per cubic centimeter.

Ragweed Combined (Giant and Short Ragweeds, in equal proportions). The pollen is weighed and extracted with ether. After removal of the ether the material is mixed with the extracting liquid, consisting of a 0.5 per cent sodium chloride solution containing approximately 0.28 per cent of sodium bicarbonate and 0.5 per cent of phenol and covered with toluene. After three days the extract is subjected to Berkefeld filtration and tested for sterility. Standardization is on the basis of pollen units, 1 pollen unit being equivalent to 0.001 mg. of pure pollen.

MENADIONE (See New and Nonofficial Remedies, 1944, p. 638).

The following dosage forms have been accepted:

SHARP & DOHME, INC., GLENOLDEN, PA.

Tablets Menadione: 1 mg.

Solution Menadione (in peanut oil) 2 mg. per cc.: 1 cc. ampuls.

SULFADIAZINE (See New and Nonofficial Remedies, 1944, p. 178).

The following dosage form has been accepted:

MCNEIL LABORATORIES, PHILADELPHIA

Tablets Sulfadiazine: 0.5 Gm.

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1944, p. 608).

The following dosage form has been accepted:

AMERICAN PHARMACEUTICAL CO., INC., NEW YORK

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SATURDAY, NOVEMBER 3, 1945

TYPHUS THERAPY

The rickettsias of typhus are obligate intracellular parasites that multiply only in the interior of host cells. In 1937 Zinsser and his associates [1] of Harvard Medical School showed that the rate of intracellular multiplication of rickettsias in Maitland tissue cultures is determined by the metabolic rate of the host cells. Under conditions of high metabolic activity, as determined by the rate of acid formation or of oxygen consumption, little or no multiplication of the intracellular parasites takes place. Only under conditions of reduced metabolic activity was active multiplication noted. This observation finds partial confirmation in the subsequent demonstration [2] that riboflavin deficiency, which slows down metabolism by interfering with internal respiration, reduces the normal resistance of rats to rickettsia infection.

In order to find substances with the opposite effect, Greiff and his associates [3] of St. Louis University School of Medicine have recently studied the influence of various vitamins, enzymes, enzyme activators and related substances on the rate of multiplication of typhus rickettsias in the yolk sac of the developing chick embryo. Groups of five day embryonated eggs were inoculated in the yolk sac with 0.1 cc. of a standard rickettsial suspension. At various intervals after this inoculation half of the members of each group were injected with various concentrations of the substances to be tested, the other half serving as untreated controls. The rate of multiplication was estimated from rickettsial counts of the yolk sac membrane made at suitable intervals after inoculation. Thus, in untreated control eggs a count of less than 1 rickettsia per oil immersion field was usually recorded during the first two days, increasing to from 10 to 100 rickettsias per field by the fourth day and to between 8,000 and 12,000 per field by the eighth day. Death usually took place on the seventh or eighth day.

Greiff found that most of the vitamins, enzyme activators and related substances thus far tested neither accelerate nor retard this control rate of multiplication. Among these negative substances are biotin, riboflavin, thiamine hydrochloride, cholin chloride, orthoaminobenzoic acid and meta-aminobenzoic acid. The only positive inhibitor thus far found is para-aminobenzoic acid. After yolk sac injection of 3.3 mg. of this B vitamin fraction the oil immersion count rarely exceeds 1 rickettsia per field at any time during the first fifteen days. All embryos remain alive until the end of the experiment. This is an antirickettsial titer equal to that previously reported from yolk sac injections of 325 Oxford units of penicillin.[4]

The therapeutic value of para-aminobenzoic acid was further tested on groups of mice inoculated intraperitoneally with multilethal doses of murine typhus rickettsias. Half of each group (controls) was fed throughout the experiment on Purine dog chow. Immediately after injection of the rickettsias the other half was placed on the same diet plus 3 per cent para-aminobenzoic acid. Of 23 normally fed (control) mice, all died of typical typhus infection on or before the seventh day. Only 1 of the 23 para-aminobenzoic acid fed mice died during this or subsequent periods, a survival rate of practically 100 per cent.

Greiff believes that this remarkable therapeutic effect was due to metabolic stimulation of host cells. He, however, disclaims priority for this discovery. Since completing his experiments he has learned that similar favorable effects from para-aminobenzoic acid therapy were previously described in unpublished confidential reports now on file with the United States of America Typhus Commission.

1. Zinsser, Hans, and Schoenbach, E. B.: J. Exper. Med. **66**: 207 (Aug.) 1937.
2. Pinkerton, Henry, and Bessey, O. A.: Science **89**: 368 (April 21) 1939.
3. Greiff, Donald; Pinkerton, Henry, and Moragues, Vicente: J. Exper. Med. **80**: 561 (Dec.) 1944.
4. Greiff, Donald, and Pinkerton, Henry: Proc. Soc. Exper. Biol. & Med. **55**: 116 (Feb.) 1944.

INTRACELLULAR ANTIBODIES

In 1913 Much,[1] Manwaring [2] and others reported experimental evidence which led them to propose a tentative theory of "partial antibodies" to account for the phenomena of acquired immunity to tuberculosis. Specific agglutinins, precipitins and other so-called antibodies are found in the circulating blood; the theory assumed that the really essential bactericidal factors are found only in the fixed tissue cells. In support of this theory it was shown [2] that tubercle bacilli, while rapidly lysed in the peritoneal cavities of tuberculous animals, are not lysed in the animal's serum. Manwaring found that the acquired power of intraperitoneal lysis of tubercle bacilli cannot be transferred to normal animals even by total blood transfusion. The essential

1. Deycke, G., and Much, H.: München. med. Wchnschr. **40**: 119, 190, 1913.
2. Manwaring, W. H., and Bronfenbrenner, J. J.: J. Exper. Med. **18**: 601, 1913.

specific bacteriolysins present in the immunized peritoneal cells apparently are not given off in detectable amounts into the blood stream; or, if given off, they presumably are destroyed or otherwise rendered inactive in much the same way that leukocytic extract is inactivated by normal blood serum.[3]

This tentative theory of essential nonhumoral antibodies in acquired immunity to tuberculosis is supported by data recently reported by Chase[4] of the Rockefeller Institute. Chase rendered guinea pigs hypersensitive to tuberculin by subcutaneous injection of killed tubercle bacilli suspended in liquid petrolatum. By the end of five to nine weeks, cutaneous reactivity to tuberculin was pronounced. Exudates were then induced in the peritoneal cavities by intraperitoneal injections of liquid petrolatum. After forty-eight hours the peritoneal cavities were washed out with heparinized Tyrode solution containing gelatin and 10 per cent normal guinea pig serum. The exudate thus obtained consisted mainly of large mononuclear cells. These cells were washed in serum-Tyrode solution and immediately injected intraperitoneally or intravenously into normal albino guinea pigs. The recipients were tested at daily intervals with old tuberculin. After a latent period of from two to three days following intraperitoneal injection (or twenty to thirty-six hours after intravenous injection) tuberculin hypersensitivity became established in the skin of the recipient. The passive hypersensitivity reached its maximum about forty-eight hours later. At this time the routine test dose of old tuberculin gives rise to a diffuse, indurated erythematous reaction. The hypersensitivity gradually fades after reaching this maximum.

Chase found that the intensity of the transferred cutaneous hypersensitivity varies with the volume of peritoneal cells and with the degree of sensitivity of the tuberculous donor. Similar transfer was never effected with the donor's serum or with the peritoneal exudates of nontuberculous guinea pigs. The peritoneal cells are inactivated by heating to 48 C. for fifteen minutes or by prolonged storage at refrigerator temperature. In addition to the peritoneal cells, cells from the spleen or lymph nodes of tuberculous animals are capable of passive transfer of tuberculin hypersensitivity.

Cellular transfer of acquired sensitivity was first demonstrated by Landsteiner[5] in 1942. He found that exudates from the peritoneal cavities of guinea pigs previously sensitized to a number of simple chemical substances would cause homologous specific skin sensitivity if injected intravenously, intraperitoneally or intracutaneously into normal guinea pigs. The nature of the presumptive anaphylactic antibody present in these peritoneal cells is still undetermined.

3. Manwaring, W. H.: J. Exper. Med. **17**: 409, 1913.
4. Chase, M. W.: Proc. Soc. Exper. Biol. & Med. **59**: 134 (June) 1945.
5. Landsteiner, Karl, and Chase, M. W.: Proc. Soc. Exper. Biol. & Med. **49**: 688, 1942.

Current Comment

DIPHTHERIA CAN BE ELIMINATED

In 1943 the death rate from diphtheria at all ages fell below 1 per hundred thousand for the first time.[1] At the same time the death rate in children under 10, in whom the disease is most frequent, has fallen below 5 per hundred thousand. Wide variation in the size of the diphtheria rates among children occurs, however, in different states: using the average figures for 1940-1942, Delaware without any deaths from diphtheria under 10 during these three years appeared at one extreme and, at the other, Arkansas and South Carolina with 13.7 deaths per hundred thousand and Oklahoma with a rate of 13.5. The available methods for control of diphtheria are sufficient to allow the complete elimination of this disease in the United States. An analysis of fatalities among children insured in a large life insurance company indicated that two factors were principally involved: delay in treatment (when the physician was not called until the fourth day of the disease or later) and the use of insufficient antitoxin. The application of modern immunization methods of susceptible persons on a countrywide basis would serve to eradicate the disease; meanwhile, emphasis on the importance of sufficiently early administration of antitoxin in adequate doses would help to prevent the unnecessary deaths of some 1,000 American children who still die of diphtheria annually.

ACTA SCANDINAVICA

In the past few months THE JOURNAL has received, thanks to more normal postal relations between Europe and the United States, a number of issues of the *Acta Scandinavica* for 1945 with an unusually large number of supplements. All the supplements, with the exception of one from Helsinki, Finland, are from Sweden, the one Scandinavian country to escape participation in the global war. The clinical papers and the supplements reflect the excellence of the medical institutions and the scientific character of clinical investigations usually found in the *Acta*. Of the ten supplements, eight are in English and two in German. Among the supplements to the *Acta medica* may be mentioned one by Nils Skiold on the clinical features and the origin of erythema nodosum, based on a study of 345 patients. Skiold shares the general concept of the condition as a nonspecific allergic phenomenon but would include in this concept erythema multiforme as well. Hans Forssman presents a study on hereditary diabetes insipidus in the course of which he had traced 5 pedigrees with 83 genebearers, involving investigation of 5,500 persons. An interesting study by Karl Axel Ekbom concerns a common but little recognized syndrome of "restless legs." Among the supplements to the *Acta chirurgica* may be mentioned an extensive study by S. Bruzelius on dicumarol from the Surgical Clinic in

1. Statistical Bulletin, Metropolitan Life Insurance Company, August 1945.

Lund. The frequency of thrombo-embolism was reduced to one third of that in the control groups, while the incidence of fatal pulmonary embolism has fallen from 0.49 per cent in two control groups to 0.16 per cent in the group treated prophylactically with dicumarol.

THE HEALTH OF THE CHINESE IN SAN FRANCISCO

The San Francisco department of public health has issued a report for the twenty year period 1924-1943 for Chinatown in San Francisco.[1] The population estimate for this district is 18,000. The Chinese as a group have continued to live under definitely substandard conditions in the area first chosen as a site for Chinatown. War industry brought a rise in income level, with more families able to assume higher living costs but unable to find better living quarters. Conditions of substandard housing and overcrowding continue to exist although the economic state has improved. In Chinatown the birth rate per thousand of population has fallen from a peak of 40.2 in 1924 to the low rate of 11.8 in 1937, with a gradual upswing to 18.8 in 1943. Since 1937 it has approximated more closely the rate for the entire city of San Francisco. In the past fifteen years Chinese births in hospitals have increased 320 per cent. At the same time, citywide births in hospitals increased 21 per cent. The younger American born Chinese parents are more eager to accept the maternity and child welfare programs, but the influence of the older foreign born parents continues to restrict educational programs. The Chinese infant mortality rates exceed those for the city as a whole. In 1936 the Chinese rate was exactly twice that for the city. In the following years the rate steadily declined to a level that compares favorably with the rest of the city. Respiratory infections and prematurity consistently constitute the principal causes of death in Chinese infants. The relative rank of the principal causes of death among the Chinese has altered since 1930, when tuberculosis indisputably outranked all others, with nephritis (chronic), heart disease, pneumonia and cancer following in order. In 1943 heart disease led the list, followed by cancer, tuberculosis, nephritis and pneumonia. In 1929 the average age at death for the city as a whole was 52.4 years and for the Chinese 41.7; in 1943 it was 57.7 and 50.2 respectively. The death rate has fallen from 22.4 per thousand in 1924 to 12.9 in 1943. The citywide rate was 12.7 in 1943. Except for tuberculosis there is comparatively little spread of contagious disease in the Chinatown area. When increased incidence of communicable diseases is reported for the entire city there is an increase in Chinatown as well, though to a comparatively less extent. In the last two citywide epidemics of poliomyelitis not a case was found among the Chinese. Few cases of influenza were reported from this area. Trachoma and acute conjunctivitis are reported with great frequency. Tuberculosis still constitutes one of the major health problems in the Chinese area. In 1939 the cases of tuberculosis seen at the Chinese Health Center were far advanced. Now the cases seen are frequently of an early type that can benefit from efficient care. The death rate from pulmonary tuberculosis among Chinese shows about the same rate of decrease as that for the entire city, but the rate persists much higher for Chinatown. Any program of public health recommended for the entire city should be effective in Chinatown as well for the Chinese people, who have responded well to public health activities, which have been of prime importance in improving the health of the Chinese.

1. Geiger, J. C.; Miller, Roslyn C.; Welke, Hilda F., and Gibson, Eunice: The Health of the Chinese in an American City—San Francisco, San Francisco Department of Public Health, 1945.

HEMORRHAGE FROM PUNCTURE BIOPSY OF THE LIVER

One great danger of biopsy of the liver, now practiced extensively by aspiration, is hemorrhage from the puncture. According to Raby [1] 7 instances of fatal hemorrhage have been reported, all in advanced or severe cases of carcinoma or pernicious anemia. Vitamin K was not given in any case before the puncture. The coagulation time was determined beforehand in only 1 case, and here clotting was delayed. Raby himself reports in detail a fatal intraperitoneal hemorrhage from puncture of a portal branch near the anterior surface of the right lobe of the liver in a woman aged 79 with jaundice of uncertain origin. The coagulation time before puncture was normal. The patient died thirty-six hours after the biopsy in spite of hemostatic treatment and blood transfusion. Raby also reports the death of a man aged 85 with senile dementia but without any hemorrhagic tendencies, which occurred three days after biopsy of the liver. The symptoms seemed obscure and postmortem did not reveal any primary cause of death. Bacteriologic examination was not made. Clearly, puncture of the liver is not without danger, especially in old persons. Precautions should never be neglected when puncture is indicated. Hemorrhagic tendencies should be excluded. Raby recommends also that the patient's blood group be determined before puncture and that the patient be watched closely after the puncture in order that transfusions may be made if necessary without delay.

1. Raby, K.: Complications and Dangers of Liver Biopsy, Nord. med. **24**: 2161 (Dec. 8) 1944.

N. N. R. 1945 AND REPRINT OF COUNCIL REPORTS FOR 1944 NOW AVAILABLE

Physicians, pharmacists, manufacturers of pharmaceuticals and indeed all who are interested in drug therapy will be pleased to know that these two annual publications of the Council on Pharmacy and Chemistry are now available. These volumes are indispensable to any one desiring to keep abreast of the latest advances in therapy. Their unusually late appearance is the result of wartime difficulties, including not only a shortage of paper and scarcity of mechanical personnel but also the fact that practically all Council members have been importantly and increasingly engaged in the war effort. The unselfish devotion of the Council members is worthy of the cause they represent—the support of rational therapy.

MEDICINE AND THE WAR

ARMY

ARMY MEDICAL RESEARCH AND DEVELOPMENT BOARD FORMED

A board to be known as the Army Medical Research and Development Board was constituted in the Office of the Surgeon General on September 1. The board is to be responsible for the planning and general supervision of all Medical Department research and development activities. Its membership will include the chiefs of the various professional services and divisions of the Office of the Surgeon General, the Air Surgeon, the Ground Surgeon, the chairman of the Division of Medical Sciences, National Research Council (by invitation), and the chairman of the Committee on Medical Research, Office of Scientific Research and Development (by invitation). The board has two operating divisions, the Research Division and the Development Division, to carry out its plans.

It is the intent of the Surgeon General to carry on an active program of research and development during the postwar period, and the new board should provide the means for maximum coordination of effort within the military service and cooperation with civilian and federal research agencies. The immediate tasks facing the board are three in number. Essential research must be continued in the existing Medical Department research and development laboratories in spite of the personnel difficulties of the period of demobilization. Plans must be made and implemented for the continuation or actual expansion of research and development in the postwar period. The demobilization of the Office of Scientific Research and Development necessitated finding other sponsorship for those CMR research contracts which warrant continuation even though hostilities have terminated. A sizable group of these contracts will be taken over by the Medical Department and administered by the Army Medical Research and Development Board.

HOSPITALS NAMED FOR REFRESHER TRAINING COURSES

Major Gen. Norman T. Kirk, Surgeon General of the Army, recently notified the commanding officers of the following hospitals that their medical services had been approved for the professional refresher training courses of Medical Corps officers to extend over a twelve weeks period:

Cushing General Hospital, Framingham, Mass.
Mason General Hospital, Brentwood, Long Island, N. Y.
Valley Forge General Hospital, Phoenixville, Pa.
Kennedy General Hospital, Memphis, Tenn.
Newton D. Baker General Hospital, Martinsburg, W. Va.
Percy Jones General Hospital, Fort Custer, Michigan.
Winter General Hospital, Topeka, Kan.
McCloskey General Hospital, Temple, Texas.
DeWitt General Hospital, Auburn, Calif.

Medical Corps officers desiring refresher training in neuropsychiatry will be permitted to serve the entire twelve weeks in the neuropsychiatric services and to rotate through the various wards of the neuropsychiatric services in order to gain experience in all phases of neuropsychiatry.

PACIFIC BATTLE CASUALTIES TO BE RETURNED BY END OF YEAR

The War Department recently announced that most of the 3,000 battle casualties still remaining in the Pacific will be returned to the United States within sixty days and all the other transportable casualties by Christmas. The majority will travel on hospital ships and troop transports, but some will return by air. Ten U. S. Army hospital ships, seven formerly part of the twenty-one ship mercy fleet which brought home 86,422 combat sick and wounded from the Atlantic, now are speeding the return of Pacific battle casualties.

Since the first army hospital ship *Acadia* docked with the first battle casualties in June 1943 the Charleston Port of Embarkation, now "port of call" for hospital ships in the Atlantic, has debarked approximately 11,000 since May.

Six of the army hospital ships are converted Liberties; the others are former troopships and cargo and passenger liners. All the ships are staffed by U. S. Army Medical Department personnel and, with the exception of the *Hope*, *Comfort* and *Mercy*, are crewed by merchant marine seamen employed by the Transportation Corps.

TROOPS TO BE VACCINATED AGAINST INFLUENZA

All army troops in the middle Pacific command will be vaccinated against influenza as part of a worldwide campaign by the Surgeon General to prevent a possible epidemic of this disease, in which mass movements of army personnel to and from the continental United States could be a contributing factor. According to Lieut. Col. T. G. Ward, preventive medicine officer, middle Pacific Surgeon's Office, medical officers hope to lessen the severity of any influenza epidemic such as the one which swept the world in November 1918. Millions of army troops, either replacements in occupation armies or combat veterans going home, will be on the move. Through the use of this new vaccine it is hoped to prevent influenza among them.

ARMY AWARDS AND COMMENDATIONS

Major Matthew Levine

The Bronze Star was recently awarded to Major Matthew Levine, formerly of Brooklyn, who served on the Army Hospital Ship *Emily H. M. Weder* from August 1944 to March 1945. According to the citation accompanying the award Major Levine "demonstrated outstanding professional qualities in support of combat operations. During the invasion of southern France, in the Italian combat zone and later during the landings on Leyte and Luzon in the Philippines this hospital ship participated in the evacuation of wounded from the established beachheads. Aware of the many problems arising from such an important mission, without regard for his personal welfare and with an all consuming zeal for rendering all service possible to our wounded, he skilfully organized the personnel of the Neuropsychiatric Service into a highly efficient unit, inspiring them with confidence in the mission to be performed. His sole aim was to save lives and to bring comfort to the sick and wounded transported aboard the ship. He succeeded in this purpose by utilizing every available means of medical skill and knowledge. His treatment of mentally disturbed patients by neuropsychiatric therapy contributed notably to the successful mission of this ship and reflects great credit on the Medical Corps." Dr. Levine graduated from Long Island College of Medicine, Brooklyn, in 1934 and entered the service July 27, 1942.

Lieutenant Colonel Benjamin L. Camp Jr.

The Legion of Merit was recently awarded to Lieut. Col. Benjamin L. Camp Jr. for his exceptionally successful execution of medical operations connected with the Allied occupation of Rome. He was cited "for exceptionally meritorious conduct in the performance of outstanding service against the enemy in Italy from Feb. 1, 1944 to May 27, 1945. . . . Also for his brilliant conception of medical planning operations and exceptionally successful execution of medical operations connected with the Allied occupation of Rome and the

exceptionally high degree of diplomacy and integrity exhibited which resulted in the optimum of cooperation between Allied and civil medical authorities." Dr. Camp was previously commended by Major Gen. Morrison C. Stayer, surgeon general of the Mediterranean Theater of Operations. This commendation read, in part, "Your problems as surgeon of the Rome Area Allied Command were many and vexing and the manner in which you and your personnel have solved them and safeguarded the lives and health of American troops is worthy of commendation." Dr. Camp graduated from Northwestern University Medical School, Chicago, in 1933 and entered the service Feb. 28, 1941.

Colonel Clifford V. Morgan

The Oak Leaf Cluster to the Legion of Merit was recently awarded to Col. Clifford V. Morgan, formerly of Washington, D. C., "for exceptionally meritorious conduct in the performance of outstanding services as deputy general purchasing agent, Forward Echelon, Headquarters Communications Zone, European Theater of Operations, from Feb. 25, 1944 to Aug. 7, 1944." The citation accompanying the award explained that "Colonel Morgan supervised and coordinated general purchasing planning as far as coordination was necessary with the 21st Army Group (British), First United States Army Group, First United States Army, Third United States Army Western Task Force, 9th Air Force and agencies of the Communications Zone staff. He ably guided and facilitated purchasing planning for overseas operations and formulated a clear and concise general purchasing plan consistent with directives of higher authority. Colonel Morgan rendered outstanding services on the continent not only by advising and personally assisting the Advance Section but also by attaching key personnel to that section for training purposes." Dr. Morgan graduated from the University of Nebraska College of Medicine, Omaha, in 1927 and entered the service July 15, 1927.

Brigadier General Royal Reynolds

Brig. Gen. Royal Reynolds, formerly of Washington, D. C., was recently awarded the Legion of Merit. The citation read "He served as commanding general of the Kennedy General Hospital, Memphis, Tenn., from June 1942 to January 1945. Assuming command when the construction was in its initial phase and when the need for hospital beds for our overseas wounded was most acute, his unusual foresight and planning ability accelerated the building program to such a degree that the necessary hospital facilities with 1,500 beds were in use by Jan. 1, 1943. Authorized to double the capacity in the fall of 1942, construction was begun in October and the new project was in operation by May 1943. A further construction project, instituted late in 1944, increased the bed capacity to 4,387. The rare ability shown by him in providing medical care of the highest quality and unusual efficiency of operation while simultaneously administering his hospital and supervising its growth resulted in a general hospital of outstanding merit." General Reynolds graduated from the University of Pennsylvania School of Medicine, Philadelphia, in 1906 and entered the service May 20, 1942.

Lieutenant Colonel Clyde B. Meffert

The Legion of Merit was recently awarded to Lieut. Col. Clyde B. Meffert, formerly of Cedar Rapids, Iowa, "for exceptionally meritorious conduct in the performance of outstanding services as chief of surgical service, 109th Evacuation Hospital, Third U. S. Army, from April 7, 1944 to Jan. 28, 1945. Lieut. Col. Meffert exhibited an unusually high degree of professional skill and exceptional administrative and organizational abilities in the fulfilment of his task. His performance of service made it possible for this organization, with only one week of unit training and two weeks of actual maneuvering, to establish an efficiently functioning hospital. Through Lieutenant Colonel Meffert's untiring efforts this superior surgical service was maintained throughout operations." Dr. Meffert graduated from the State University of Iowa College of Medicine, Iowa City, in 1931 and entered the service June 16, 1943.

Lieutenant Colonel Nevin B. Anderson

Lieut. Col. Nevin B. Anderson, formerly of Des Moines, Iowa, was recently awarded the Legion of Merit for services in North Africa, Italy and France from Sept. 1, 1943 to Dec. 31, 1944. The citation accompanying the award stated that it was given "for exceptionally meritorious conduct in the performance of outstanding services in North Africa, Italy and France from September 1943 to Dec. 31, 1944. Commanding a unit designated for exclusive operation in neuropsychiatry, Lieutenant Colonel Anderson, despite critical shortages of specialists and insufficiencies of suitable facilities, displayed marked ingenuity and efficiency in planning and developing an unprecedented service that paid untold dividends in the treatment of mental cases in two theaters of operation. Utilizing ex-line officers and noncommissioned personnel he provided an occupational therapy program which not only expedited the rehabilitation and restoration of patients but also greatly increased the facilities of his installation. Through the application of sound principles and superior professional skill, Lieutenant Colonel Anderson contributed immeasurably to the success of the combat forces." Dr. Anderson graduated from the State University of Iowa College of Medicine, Iowa City, in 1920 and entered the service Jan. 13, 1941.

Colonel James W. Bass

Col. James W. Bass, formerly of Dallas, Texas, was recently awarded the Legion of Merit for "exceptionally meritorious achievement in the performance of outstanding services in the Southwest Pacific Area, from April 12, 1942 to June 1, 1945. As chief of the Preventive Medicine Section, United States Army Services of Supply, Colonel Bass was responsible for the planning, organizing and supervision of the statistical and preventive medicine program of the theater. Despite formidable problems incident to the medical care of large numbers of men under hazardous and deleterious tropical conditions, he carried a sound and comprehensive program through the formative stage to completion in an exceptionally short period of time. In addition, he developed a department to maintain vital statistics and medical records of inestimable value to the service. As chief inspector, he personally supervised much of the field work of the early operational period and was largely responsible for sanitation measures essential to the maintenance of the present high level of health within the theater. By his professional capability, inspiring leadership and devotion to duty, Colonel Bass has substantially aided in the conservation of manpower throughout the Southwest Pacific Area." Dr. Bass graduated from Baylor University College of Medicine, Dallas, in 1925 and entered the service May 15, 1941.

Captain Rae N. Foster

Capt. Rae N. Foster, formerly of Portland, Ore., was recently awarded the Bronze Star "for meritorious service in connection with military operations against an enemy of the United States during the period June 6, 1944 to May 7, 1945. Captain Foster, serving as an anesthetist with a general surgical team, 4th Auxiliary Surgical Group, distinguished himself by his outstanding performance of duty. The professional skill and untiring energy he displayed, his resourcefulness and loyal devotion to duty reflect great credit on himself and on the military service." Dr. Foster graduated from the College of Medical Evangelists, Loma-Linda, Calif., in 1936 and entered the service July 26, 1941.

Captain Leonard M. Klein

The Bronze Star was recently awarded to Capt. Leonard M. Klein, formerly of Boston. The citation stated that "during the period May 7-May 12, 1945 Captain Klein remained on duty constantly, day and night, at . . . an aid station . . . near Hot Corners, Luzon, Philippine Islands. Because of his untiring efforts and his superior knowledge and skill, Captain Klein was responsible for saving many sick and wounded from long periods of convalescence or possible death. Captain Klein's attention to duty was in accordance with the highest standards of his profession and office." Dr. Klein graduated from Tufts College Medical School, Boston, in 1940 and entered the service Aug. 6, 1942.

Colonel Robert F. Bradish

The Legion of Merit was recently awarded to Col. Robert F. Bradish, formerly of Washington, D. C., who as post surgeon, New Orleans Port of Embarkation, from September 1943 to April 1945, displayed a high degree of organizing and professional ability in establishing and coordinating a highly efficient medical service for both military and civilian personnel within the command, resulting in substantially lowering the noneffective sick rate and in effecting noteworthy reduction in medical operating personnel. The citation accompanying the award goes on to state that "his work in planning, supplying and operating all troop ship hospitals assigned to New Orleans Port of Embarkation and in the evacuation of patients of all categories from overseas areas served by the port was characterized by keen perception of existing conditions and skilful approach to the voluminous problems involved. The resourcefulness, seasoned technical judgment and exceptional professional ability displayed by him contributed materially to the successful operations of the port." Dr. Bradish graduated from the University of Vermont College of Medicine, Burlington, in 1926 and entered the service July 16, 1926.

Captain William T. Layman

The Bronze Star was recently awarded to Capt. William T. Layman, formerly of Hagerstown, Md., "for meritorious service in direct support of combat operations from July 28, 1944 to May 8, 1945 in France, Belgium, Holland and Germany. Although many bridging operations were carried out under observed enemy artillery fire, Captain Layman remained at the site of operations, rendering immediate aid as battalion surgeon to the wounded. By his tireless efforts, disregard for his own personal safety and fearless devotion to duty, he was an inspiration to the men working under him and reflected much credit on himself and the armed forces." Dr. Layman graduated from the University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, in 1939 and entered the service May 19, 1942.

Captain James S. Walker

Capt. James S. Walker, formerly of Indianapolis, was recently awarded the Bronze Star for "thirty months' meritorious service with the 46th Engineers, and treating wounded under enemy fire during the landing on Leyte in October 1944." Dr. Walker is now chief of the ear, nose and throat section of the 59th Station Hospital in the Philippines. He graduated from Indiana University School of Medicine, Indianapolis, in 1939 and entered the service Oct. 22, 1941.

Captain Alfred R. Brin

The Certificate of Merit was recently awarded to Capt. Alfred R. Brin, formerly of Terrell, Texas, for "having devoted his time selflessly to duties in an outstanding manner in caring for his many patients during the period from June 1944 to June 1945 in Malmesbury, Wilts, England, resulting in outstanding accomplishments and substantial contributions to the professional field of urology." Dr. Brin graduated from the University of Texas Medical Branch, Galveston, in 1938 and entered the service Sept. 24, 1940.

NAVY

NAVY HOSPITALS FOR ASTHMATIC PATIENTS

The Bureau of Medicine and Surgery, Navy Department, has allocated a hospital facility devoted in a special manner to the study and care of patients with asthma. The hospital is located in Banning, Calif., and an efficient staff under specialists trained in allergy has been assigned. The area was selected because of environmental conditions conducive to the advancement of patients afflicted with allergic diseases. The high altitude, the equable climate and the low pollen and mold counts make the facilities ideal for a control study of asthma. Over 200 asthmatic patients were recently admitted to the hospital, and preliminary studies have revealed that these patients may be catalogued into three general classes: (1) those whose allergy (asthma) existed prior to enlistment (EPTE), (2) those in whom it did not exist prior to enlistment (DNEPTE) and (3) those whose asthma did not exist prior to enlistment, although a state of hypersensitivity did exist prior to enlistment (EPTE aggravated). Groups 1 and 2 represent 65 per cent and 15 per cent respectively of the patient load, whereas group 3, 20 per cent, represents cases of hypersensitivity prior to enlistment, although no manifestations of asthma were present until after the patient entered the service. Most of the men had seen service overseas, chiefly in New Guinea and in the Philippine, Solomon and Admiralty Islands, and approximately 90 per cent of them had their affliction aggravated by this type of foreign duty.

Although present facilities permit only limited investigation and treatment, more extensive work, particularly regarding offending factors and desensitization studies, are planned for the immediate future.

NAVY AWARDS AND COMMENDATIONS

Commander Stephen Eugene Flynn

The Bronze Star was recently awarded to Comdr. Stephen Eugene Flynn, formerly of Washington, D. C., "for distinguishing himself by meritorious conduct in the line of his profession while serving as senior medical officer of the U. S. S. *Columbia* during the assault and bombardment operation at Lingayen Gulf, Luzon, Philippine Islands, during Jan. 6-9, 1945. He administered his department with such excellent foresight that when the *Columbia* was hit by enemy dive bombers January 6 and 9, the large number of casualties which resulted were handled with outstanding efficiency. During the entire period while the ship was under repeated and determined enemy air attacks he worked continuously and tirelessly caring for the wounded and dying. He showed outstanding alertness and initiative by providing, during this trying period with a large number of wounded, for the normal routine of the medical department, even to the extent of performing an emergency appendectomy on the night of January 7. His service and conduct throughout distinguished him among those performing duties of the same character." Dr. Flynn graduated from Creighton University School of Medicine, Omaha, in 1930 and entered the service Dec. 10, 1931.

Lieutenant Max R. Long

The Silver Star was recently awarded to Lieut. Max R. Long, formerly of Indianapolis, "for conspicuous gallantry and intrepidity in action against the enemy as shore party evacuation officer during operations on Saipan. During the morning of June 16, 1944, while the beach from which he was operating was under direct artillery fire, Lieutenant Long, with utter disregard for his own personal safety, continued rendering aid, performing necessary surgery and personally attending to the evacuation of casualties. His efforts, while thus exposed to enemy fire, were a source of inspiration to his own men and a comfort to casualties passing through his hands. Working continuously throughout the first seventy-two hours, he succeeded in evacuating approximately 1,200 wounded men from a heavily congested beach." Dr. Long graduated from Indiana University School of Medicine, Indianapolis, in 1940 and entered the service March 21, 1942.

Lieutenant Commander John W. Stevens

The Navy and Marine Corps Medal was recently awarded to Lieut. Comdr. John W. Stevens, formerly of DuQuoin, Ill., for heroism as battalion surgeon during an aerial bombardment off Roi and Namur in February 1944. The presentation was made in the presence of the entire Georgia Pre-Flight School medical staff, Athens, Ga. Dr. Stevens graduated from the University of Illinois College of Medicine, Chicago, in 1931 and entered the service May 21, 1942.

MISCELLANEOUS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their house staff quota allotted by the Procurement and Assignment Service.

(Continuation of list in THE JOURNAL, September 29, page 359)

CONNECTICUT

New Britain General Hospital, New Britain. Capacity, 258; admissions, 8,954. Dr. W. Weston Benjamin, Managing Director (interns; residents—mixed service, April 1, 1946).

MICHIGAN

Saginaw General Hospital, Saginaw. Capacity, 151; admissions, 4,024. Mr. R. E. Raper, Superintendent (interns).

MINNESOTA

Hibbing General Hospital, Hibbing. Capacity, 152; admissions, 3,556. Sister M. Assumpta, Administrator (residents—mixed service).

NEW YORK

Triboro Hospital, Jamaica. Capacity, 557; admissions, 514. Dr. Henry I. Fineberg, Medical Superintendent (residents—tuberculosis).

Bronx Hospital, New York City. Capacity, 409; admissions, 10,341. Dr. A. A. Karan, Director (8 interns, April 1, 1946).

OHIO

Lutheran Hospital, Cleveland. Capacity, 160; admissions, 4,525. Mr. Lee S. Lanpher, Superintendent (interns, April 1 and July 1, 1946).

PENNSYLVANIA

Women's Homoeopathic Hospital, Philadelphia. Capacity, 200; admissions, 3,197. Miss Mary A. Smith, Administrator (resident—male or female).

UNRRA PROGRAM FOR WINTER MEDICAL CARE IN U. S. OCCUPIED GERMANY

Health officers of the United Nations Relief and Rehabilitation Administration have recently completed an expanded program of winter medical care for the remaining displaced persons in assembly centers in U. S. occupied Germany. Care will include full scale hospital and dispensary services and an extensive schedule of preventive medicine based on standard public health procedures. The work will go forward under the supervision of the Public Health Branch of the U. S. Military Government. Approximately 500,000 displaced persons are said to be in the U. S. occupied zone at the present time.

Anticipating a severe winter with critical fuel shortages in Germany, UNRRA doctors are immunizing the displaced persons for typhus, diphtheria, typhoid and smallpox. Supplies of the sulfonamide drugs are being stocked for pneumonia. The possibility of typhoid with the spring thaws is also being met now by sanitation measures to check the disease at its sources.

Lieut. Col. David C. Elliott of Cincinnati, chief UNRRA medical officer for the zone, stated that, while it is difficult to forecast accurately the winter health prospects of the displaced persons, reliance has been placed on established health service technics of preparing in advance for the possibility of critical developments.

UNRRA REPORTS ON THREATENED TYPHOID EPIDEMIC IN ALBANIA

Cooperative efforts between authorities in Tirana, Albania, and officials of the United Nations Relief and Rehabilitation Administration broke down a threatened epidemic of typhoid in the capital city of Albania and saved an unknown number of lives. The war had doubled the city's normal population of 40,000 persons, with consequent overcrowding and strain on the city's water and sanitary facilities. When 600 typhoid cases were reported in the outbreak, the Albanian minister of health appealed to Dr. W. E. Thompson of England, UNRRA's director of health attached to its Albanian mission. Dr. Thompson cabled UNRRA area headquarters at Caserta for emergency shipment of 150,000 units of typhoid vaccine. All available medical personnel were mobilized, and residents of the city were vaccinated by the thousands.

WARTIME GRADUATE MEDICAL MEETINGS

The following subjects and speakers for Wartime Graduate Medical Meetings have just been announced:

Illinois

Station Hospital, Camp Grant: Infections of the Hand, Dr. Sumner Koch, November 21.

Regional Hospital, Chanute Field, Rantoul: Traumatic Intracranial Hemorrhage, Dr. Paul C. Bucy, November 14.

Station Hospital, Fort Sheridan: Types of Diabetes Mellitus and Their Treatment, Dr. Arthur R. Colwell, November 14.

Gardiner General Hospital, Chicago: Problems in Returning to Practice in Metropolitan Area, Dr. Francis Strauss, November 7.

Mayo General Hospital, Galesburg: Surgical Treatment of Gastroduodenal Ulcer, Dr. Lester R. Dragstedt, November 21.

Vaughan General Hospital, Hines: A Method for Urologic Diagnosis, Dr. D. K. Rose, November 17.

Indiana

Billings General Hospital, Fort Benjamin Harrison: The Use of Chemotherapeutics and Surgery in Chronic Infections of Bone, Dr. Albert J. Key, November 13.

Tennessee

Kennedy General Hospital, Memphis: Infectious Hepatitis, Dr. M. Herbert Barker and Dr. Thomas F. Francis, November 13; Protein Metabolism and Surgical Convalescence, Dr. Robert Elman, November 23.

Washington

Baxter General Hospital, Spokane: Preparation of the Mouth for Immediate Dentures, Major Elmer O. Hinman, November 9; War Deafness, Capt. Robert E. Priest, November 16; Keratitis Caused by Emetine Hydrochloride, Major Everett B. Muir, November 16; Tropical Skin Disease, Capt. William Wolf, November 23.

Wisconsin

Station Hospital, Camp McCoy: The Nutrition of the Recalcitrant Patient, Dr. Robert W. Keeton, November 14; Peptic Ulcer, Dr. Walter L. Palmer, November 28.

Station Hospital, Truax Field, Madison: The Clinical Significance of Hoarseness, Dr. Paul Holinger, November 7; Diabetes, Dr. Elmer L. Sevringhaus, November 21.

VETERANS

MAGNUSON BECOMES ASSISTANT TO HAWLEY

Dr. Paul B. Magnuson, Chicago, has accepted a post in Washington as assistant to Major Gen. Paul R. Hawley, Surgeon General of the Veterans Administration. His duties will be connected with a plan to appoint civilian doctors to veterans' hospitals, especially civilian doctors who have seen service in the Army in the second world war, and whose record indicates that they have been devoted to their duties and service to the soldier.

Dr. Magnuson has taken a leave of absence from his duties at Northwestern University Medical School as professor of bone and joint surgery and will devote his full time during the next few months to this assignment. He is not permanently giving up practice or teaching in the medical school and plans to return to his practice as soon as the organization of veterans' care is well under way. This, as indicated now, should not be more than six months.

PHYSICIANS SEPARATED FROM SERVICE

ARMY MEDICAL CORPS OFFICERS RECOMMENDED FOR/OR RELIEVED FROM ACTIVE DUTY

Name Rank Address

Alabama

Askew, William M. Jr., Major, Greenville.
Nungester, Garrold H., Capt., 402 Canal St., Decatur.
Williams, Ernest B., Capt., 7 Audubon Road, Montgomery.

Arizona

Dienger, Bernard C., Capt., La Posada, Winslow.
Perkins, Frederick P., Lt. Col., Phoenix.
Shapiro, David, Capt., 1105 6th Ave., Safford.
Shultz, William G., Lt. Col., 602 Valley Bank Bldg., Tucson.
Shupe, Reed D., Lt. Col., 404 Luhrs Bldg., Phoenix.
Truman, George C., Capt., 108 W. 4th St., Mesa.

California

Adams, George F., Major, 55 Palm Ave., San Francisco.
Barbour, Nathan P., Col., Medico-Dental Bldg., Stockton.
Beuchamp, Mark L., Capt., 212 Quincy Ave., Long Beach.
Briner, Charles C., Major, 1112 Lincoln Way, Auburn.
Burns, Herschel S., Lt. Col., 265 Naomi Ave., Arcadia.
Collins, James W., Capt., Starislause County Hosp., Modesto.
Greene, William W., Major, 2965-25th Ave., San Francisco.
Husser, George, Capt., 827-32nd St., Richmond.
Mitchelson, David D. S., Capt., 10350 LaGrage, Los Angeles.
Mudry, Joseph, Capt., 383 W. 6th St., San Pedro.
Nagel, Sherman A., Jr., Capt., 1200 N. State St., Los Angeles.
Norberg, Raymond W., Major, 1632 Draper St., Kingsbury.
Perez, E. R., Lt. Col., 640 Junipero Sella Blvd., San Francisco.
Pritchard, Jacob L., Lt. Col., 311 S. 1st St., San Jose.
Ray, Louis O., Capt., Tule Lake.
Reinard, Louis, Capt., 3762 Amesbury Rd., Los Angeles.
Richards, Ezra E., Major, 1214 Burlingame Ave., Burlingame.
Robertson, Donald L., Capt., 1621 Elmwood Ct., Modesto.
Rosoff, Leonard, Capt., Apt. 4, 120 S. Flores, Los Angeles.
Schumacher, George O., Major, 255 San Bernardino St., Loma Linda.
Smith, Charles C., Capt., Providence Hosp., Oakland.
Soderstrom, Edwin M., Major, 49-22nd St., Merced.
Steven, Robert A., Major, 34 San Andreas Way, San Francisco.
Stickler, Joseph H., Major, 4031 Hampstead Rd., Flintridge, Pasadena.
Syman, Leo W., Capt., Shell Beach.
Tucker, Marshall B., Capt., 5847 Chelton Drive, Oakland.
Van de Carr, Francis R., Capt., 51 Prospect Road, Piedmont.
Weinberg, Samuel J., Major, 231 Thurston Ave., Los Angeles.
White, Thomas R., Major, 520 Sunset Drive, Redlands.
Whiteley, Robert K., Major, 571 Hamilton Ave., Palo Alto.
Zide, Harry A., Major, 1911 Wilshire Blvd., Los Angeles.

Colorado

Allen, Kenneth D. A., Col., 452 Metropolitan Bldg., Denver.
Magid, Moreton A., Major, Room 730 Republic Bldg., Denver.
Richards, Robert B., Capt., 624 E. Beaver Ave., Ft. Morgan.
Spangler, Edward L., Major, Ouray.
Verploeg, Ralph H., Lt. Col., 2968 Ash St., Denver.
Wolfe, Joseph, Major, 850 So. Franklin St., Denver.

Connecticut

Albom, Jack J., Major, 177 Ferry St., New Haven.
Berman, Bernard A., Major, 161 North Main St., Waterbury.
Buckhout, G. A., Capt., 127 Fairmount Terrace, Bridgeport.
Burness, Sidney H., Lt. Col., 286 Fern St., West Hartford.
Centrone, Patrick A., Capt., 146 Cross St., Middleton.
Chester, Lewis, Capt., 357 Allen St., New Britain.
Cogland, John L., Lt. Col., 600 Walcott Hill Rd., Wethersfield.
Dionne, Ulric A., Capt., Columbia Blvd., Waterbury.
Hanley, Joseph B., Capt., Todd Hollow Road, Terryville.
Harwood, Paul H., Jr., Capt., Southport.
Koffler, Arthur, 1st Lt., 90 Glenbrook Road, Stamford.
Lowell, William H., Jr., Major, 112 Church St., Wethersfield.
Merriam, Philip G., Capt., 102 Prospect St., New Britain.
Miller, Harry B., Major, 20 Colebrook St., Hartford.
Mills, Clifford W., Capt., % 58 Washington Ave., Stamford.
Shenker, Benjamin M., Capt., 94 Irving St., Hartford.
Silver, Gershon B., Major, 125 Mansfield St., Hartford.
Wallace, Victor G. H., Lt. Col., Butlers Island, Darien.
Wentworth, John H., Major, 240 Oliver Rd., New Haven.

District of Columbia

Blair, Montgomery, Lt. Col., 84 Kalorama Circle, Washington.
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Farrell, George R., Major, 1830 Eye St., N.W. Washington.
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Irving, R. H., Capt., 810 New Jersey Ave., N.W., Washington.
Jarman, Bernard L., Lt. Col., 1726 Eye St. N.W., Washington.
Jennings, Edward C., Capt., Mt. Alto Hospital, Washington.
Katzman, H., Major, 4550 Connecticut Ave., N.W., Washington.
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Martin, C. J., Capt., Gallinger Municipal Hosp., Washington.
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Osbourn, Raymond A., Capt., 811 Taylor St. N.W., Washington.
Reichard, Morris, Major, 3221 Connecticut Ave., Washington.
Sullivan, A. J., Lt. Col., 3413 Texas Ave., S.E., Washington.
Todd, Oswald V., Major, St. Elizabeths Hosp., Washington.

Florida

Berry, Courtlandt D., Capt., 316 Exchange Bldg., Orlando.
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Girardin, Alphonse L. Jr., Capt., 915 Monlo Rd., Ft. Myers.
Hogg, Bruce M., Major, 4031 Kiaora St., Coconut Grove.
Johnson, Wince A. J., Capt., 833½ No. Florida Ave., Lakeland.
Ledrew, Frederick, Lt. Col., 7611 Collins Ave., Miami Beach.
Rose, Joseph, Major, 1345 Talbot Ave., Jacksonville.
Rubin, Nathan S., Lt. Col., 11 W. Garden St., Pensacola.
Sandberg, Thowald D., Major, 1210 Sevilla, Coral Gables.
Sayre, Robert F., Capt., Jasper.
Scarborough, Chafee A., Capt., 460 N.E. 52nd Terr., Miami.
Sisler, Bruce H., Lt. Col., Miami Beach.
Turberville, Joe I., Capt., Century.
Wentzel, Willet E., Capt., 619 25th St., Bradenton.

Georgia

Bowden, Ralph O., Capt., 24 W. Gaston St., Savannah.
Brown, Felix B., Major, 17-E 52nd St., Savanah.
Burke, Benjamin R., Major, 1996 Ponce de Leon Ave., Atlanta.
Christensen, L. M., 1st. Lt., Fla. Sanitarium & Hosp., Orlando.
Curtis, Walker L., Capt., College Park.
Ferguson, Anderson D. Jr., Capt., West Point.
Ferguson, Ira A., Col., 353 Argonne Drive, N.W. Atlanta.
Frankel, David E., Major, Ware Co. Hosp., Waycross.
Graham. Wistar L., Jr., Capt., Univ. Hosp., Augusta.
Holloway, C. E., Lt. Col., 269 Moreland Ave., N.E., Atlanta.
Kessler, Sidney N., Capt., 1241 Virginia Ave., N.E., Atlanta.
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Linch, Albert O., Major, 943 Rosedale Rd., N.E. Atlanta.
Martin, John D., Jr., Lt. Col., 485 Claire Drive N.E., Atlanta.
Montgomery, John C., Major, Vet's Admn., Augusta.
Mulherin, Philip A., Lt. Col., 2421 Walton Way, Augusta.
Musarra, Elmer A., Major, 121 Wright St., Marietta.

Illinois

Katz, Charles J., Major, 133 No. Scoville Ave., Oak Park.
Landes, Ralph R., Capt., Michael Reese Hosp., Chicago.
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Marquardt, T. R., Capt., 117 W. St. Charles Rd., Lombard.
Mead, Newton C., Major, 803 Simpson S., Evanston.
Meltzer, Herman L., Lt. Col., 800 North Side Sq., Clinton.
Miller, Charles H., Jr., Major, Moweaqua.
Murphy, Francis C., Capt., 1835 W. Harrison St., Chicago.
Potekin, Jesse S., Capt., 4000 W. Washington, Chicago.
Radyminski, S. F., Lt. Col., 5915 N. California Ave., Chicago.
Raider, Jack H., Major, 4137 N. Troy St., Chicago.
Sack, Charles I., Capt., 8149 S. Vernon Ave., Chicago.
Schaller, Edward H., Capt., 305 E. 4th St., Waterloo.
Smith, Louis D., Lt. Col., 1640 E. 50th St., Chicago.
Teasley, B. C., Jr., Lt. Col., 101 E. Chestnut St., Robinson.
Waller, James B., Lt. Col., 445 S. Fairview, Decatur.
Weiner, Sam F., Capt., 836 E. 45th St., Chicago.
Weir, Edgar W., Major, Atwood.
Whitfield, Harvey J., Major, 606 E. 50th Pl., Chicago.
Winer, Allen E., Capt., 3703 W. Grenshaw Ave., Chicago.
Winskunas, Felix C., Capt., 7004 S. Fairfield Ave., Chicago.

PHYSICIANS SEPARATED FROM SERVICE

Name Rank Address

Indiana

Allen, Frederick K., Capt., Fredericksburg.
Aucreman, Charles J., Capt., 304 W. High, Montpelier.
Brookie, Roger W., Major, 16 S. Center St., Flora.
Cassidy, John L., Major, 1608 Brookside Dr., Evansville.
Challman, William B., Capt., 631 Locust St., Mt. Vernon.
Clouse, Paul A., Major, 2217 W. Illinois St., Evansville.
Du Bois, Ramon, Capt., West Point.
Dykhuizen, T. A., Capt., 608 E. Washington St., Frankfort.
Everly, Ralph V., Capt., 6118 Norwaldo St., Indianapolis.
Firestein, Ray, 1st Lt., 2010 N. Meridian St., Indianapolis.
Gates, George E., Capt., 517 E. Altgeld St., South Bend.
Gillespie, Jacob E., Capt., 523 Hume Mansur Bldg., Indianapolis.
Gregg, Albert F., Major, 835 Lincoln Ave., Connersville.
Grove, Robert H., Major, Scircleville.
Hart, Lenpha, P., Lt. Col., 905 S.E. 2nd St., Evansville.
Harvey, B. J., Major, 510-15 Lafayette Life Bldg., Lafayette.
Hillery, John L., Lt. Col., Silver Lake.
Laubscher, Clarence A., Capt., R.R. 2, Evansville.
Lybrook, William B., Major, RFD 2, Galveston.
McArdle, Edward G., Capt., 1215 Sheridan Ct., Fort Wayne.
McCoy, George A., Capt., 53 N. Bolton Ave., Indianapolis.
Malcolm, Russell L., Lt. Col., 29 S. 21st, Richmond.
Martin, Loren H., Capt., 5069 W. 15th St., Indianapolis.
Mason, Everett E., Lt. Col., 2318 Mulberry Ave., Evansville.
Matthew, John R., Capt., 2 Pearl St., Knox.
Meredith, Elwood J., Major, 200 S. 20th St., Richmond.
Openshaw, James F., Capt., Goodland.
Paris, Durward W., Capt., RFD 6, Kokomo.
Ramsey, Hugh S., Capt., 612 E. Univ. St., Bloomington.
Raney, Ben B., Capt., 370 E. Vincennes St., Linton.
Ropp, Harold E., Capt., New Harmony.
Savage, Arthur R., Capt., 1602 Fairhill Rd., Fort Wayne.
Simmons, Frederick H., Capt., St. Vincents Hosp., Indianapolis.
Smallwood, Robert B., Capt., Bedford.
Smith, Lowell C., Major, 419 Meridian St., W. Lafayette.
Stewart, James H., Major, 803 S. Boots St., Marion.
Stout, Richard B., Major, 412 2nd St., Elkhart.
Stubbins, William M., Capt., RR 1, % C. W. Neu., Elkhart.
Trockman, Richard J., Major, 615 Englewood Ave., Evansville.
Weddle, Charles O., Capt., 1210 N. East St., Lebanon.
Whitlock, Francis C., Capt., 1924 N. Talbot, Indianapolis.
Wilson, Fred M., 1st Lt., 107 East Blvd., Kokomo.
Wolfram, Don J., Lt. Col., 418 E. 15th St., Indianapolis.
Zwickel, Ralph E., Capt., P. O. Box 386, Newburgh.

Iowa

Allen, James H., Major, 715 River St., Iowa City.
Allen, Roy J., Major, Sumner.
Anspach, Royal S., Lt. Col., Mitchellville.
Boden, Worthey C., Capt., 2669 Ripley St., Davenport.
Buxton, Otho C., Capt., 500 Buxton Dr., Webster City.
Castell, John W., Capt., Fairfield.
Cooper, Wayne K., Major, 17 So. 17th St., Ft. Dodge.
Corcoran, Thomas E., Capt., Rock Rapids.
Donnelly, Bernard A., Major, 801½ Triangle Pl., Iowa City.
Dorner, Ralph A., Major, University Hosp., Iowa City.
Doyle, Joseph L., Capt., Sigourney.
Dressler, John B., Capt., 709 Main, Ida Grove.
Englerth, Frederick L., Capt., Univ. of Iowa Hosp., Iowa City.
Gittler, Ludwig, Lt. Col., Fairfield.
Glassman, Arthur L., Capt., 421 S. Dodge St., Iowa City.
Hanson, Lawrence C., Capt., Jefferson.
Hardin, Robert C., Lt. Col., 318 E. Jefferson, Iowa City.
Hulse, Charles A., Major, 3927 University Ave., Des Moines.
Kimball, John Egbert, Jr., Major, Univ. Hospitals, Iowa City.
Koehne, Frederick D., Major, Oakland.
Lannon, James W., Capt. 311 Main, Clear Lake.
Limburg, John I., Jr., Capt., 303 W. Lincolnway, Jefferson.
Maloney, Paul J., Capt., 2342 York St., Des Moines.
Maresh, Gerald S., Major, 424 S. Summit St., Iowa City.
Meffert, Clyde B., Lt. Col., 117 3d St., Cedar Rapids.
Meyer, Milo G., Lt. Col., 407 Masonic Bldg., Marshalltown.
Moriarty, John F., Capt., Rock Rapids.
Osincup, Paul W., Capt., 487 Orpheum Bldg., Sioux City.
Parke, John, Major, 2319 C Ave. N.E., Cedar Rapids.
Peterson, Vernon W., Col., Care A. G. Vaala, Lawler.
Rarick, Ivan H., Capt., 3925 Floyd Ave., Sioux City.
Ryan, Cyril J., Capt., 1109 N. Oak St., Creston.
Shaw, Robert E., 1st Lt., 317 2nd Ave., N.W. Waverly.
Smith, Rex I., Capt., 501 Campbell Ave., Waterloo.

Kansas

Bena, James H., Major, Smith Clinic, Pittsburg.
Blank, John N., Major, Buhler.
Davis, Donald R., Capt., 910 Second St., Dodge City.
Christmann, Marshall E., Capt., Pratt.
Cushing, Robert L., Major, 1½ N. Main St., Ft. Scott.
Haigler, Frederick H., Jr., Lt. Col., Box 23, Cherokee.
Hover, Galen M., Lt. Col., 324 West 6th St., Junction City.
Hunter, Kenneth R., Capt., Lebo.
Jewell, Thomas C., Capt., Medicine Lodge.
Kent, Clifford F., Major, RFD 1, Mission.
Miller, Clyde W., Capt., 352 So. Rutan, Wichita.
Moorhead, Frank A., Capt., 709 Main St., Neodesha.
Mullen, C. J., Lt. Col., 1828 Washington Blvd., Kansas City.
Rhoades, Gordon H., Capt., Hertzler Clinic, Halstead.
Riedel, Robert H., Major, Osage City.
Shanklin, John H., Major, 1050 Sandusky, Kansas City.
Thorpe, George L., Major, Valley Center.
Underwood, Charles C., Capt., 515 Exchange, Emporia.
Woodard, Lawrence E., Capt., 407 E. 6th St., Kinsley.
Wulff, Edwin T., Major, 905 Laramie St., Atchison.

Kentucky

Dye, Fred C., Major, 1749 Deerwood Ave., Louisville.
Evans, Orville T., Capt., Mt. Sterling.
Miller, James W., Lt. Col., Greensburg.
Palmer, Lee, Col., 575 Barberry Lane, Louisville.
Pennington, William H., Lt. Col., 215 Chenault Rd., Lexington.
Rankin, Fred Wharton, B.G., Cave Hill Farm, Harrodsburg Pike, Lexington.
Riggs, Robert C., Major, 200 E. Main St., Lexington.

Louisiana

Bienvenu, Oscar J., Capt., Opelousas.
Connell, John R., Major, Forest Hill.
Crow, Richard D., Capt., 803 Jordan, Shreveport.
Dach, Richard J., Capt., Charity Hospital, New Orleans.
Dalton, Orien E., 1st Lt., Jeanerette Rd., New Iberia.
Davis, David W., Capt., 1474 Letitia St., Baton Rouge.
Davis, Frank H., Capt., 403 Myrtle Blvd., Lafayette.
Foster, Furman L., Lt. Col., Rural Route, Hico.
Goss, Vernon V., 1st. Lt., R. F. D., Church Point.
Hart, William W., Capt., Fletcher Clinic, Ringgold.
Hunt, Robert E., Major, 2403 Albert St., Alexandria.
Lamansky, Isadore M., Capt., Weber Bldg., Lake Charles.
Marino, Joseph B., Capt., 3510 Bank St., New Orleans.
Morrison, B. O., Capt., Civil Courts Bldg., New Orleans.
Parrott, John H., Major, Riverside Sanatarium, Monroe.
Roane, Henry S. Jr., Lt. Col., Route 4, Ruston.
Romeo, Zachary J., Major, 2703 Robert St., New Orleans.
Russo, Salvadore J., Capt., 702 W. College, Lafayette.
Selser, Richard E., Lt. Col., Charity Hospital, New Orleans.
Stander, Leonard H., Major, 2307 Weller Ave., Istrouma.
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Yancey, C. T., Capt., Charity Hosp. of Louisiana, New Orleans.
Young, Richard W., Major, Baton Rouge.

Maryland

Barrett, Morris K., Major, 4525 Maple Ave., Bethesda.
Bond, John P., Capt., Baltimore City Hosp. Baltimore.
Brodsky, Alexander E., 1st Lt., 2220 Park Ave., Baltimore.
Donovan, James M., Capt., Kernan Hosp., Baltimore.
Franklin, Joseph P., Lt. Col., Box 690, Cumberland.
Goodman, Julius H., Capt., 3400 E. Baltimore St., Baltimore.
Higgins, Paul Jr., Capt., Johns Hopkins Hospital, Baltimore.
Hooker, Russell H., Capt., 1016 St. George Rd., Baltimore.
Hull, Harry C., Col., 3799 Juniper Rd., Baltimore.
Jandorf, R. D., Capt., Riviera Apt. 3, Lake Dr., Baltimore.
Karlan, A. Morton, Capt., Stewarts' Cottage, Berwyn.
Kilby, Walter L., Lt. Col., 4419 Marble Hall Rd., Baltimore.
Kolman, Lester N., Major, 3700 Park Heights Ave., Baltimore.
Meyer, Eugene, III, Capt., 1936 McElderry St., Baltimore.
Norcross, John A., Major, 9211 Georgia Ave., Silver Spring.
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Schaffer, A. J., Lt. Col., 3502 Southvale Rd., Pikesville.
Smith, John P., Capt., 3005 Epstern Ave., Baltimore.
Sturgis, William J., Jr., Major, Laurel.
Thomas, Ramsey B., Lt. Col., Relay.
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Wolf, Nathan, Major, 2419 N. Pulaski St., Baltimore.

PHYSICIANS SEPARATED FROM SERVICE

Name Rank Address

Massachusetts

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Cincotti, John J., Major, 442 Pleasant St., Belmont.
Dalton, Kenneth V., Capt., 133 Washington St., Weymouth.
Doyle, Joseph T., 1st. Lt., Boston City Hosp., Boston.
Greene, Jeremiah E., Lt. Col., 47 Paul St., Newton Center.
Hedblom, Carl A., Jr., Capt., 983 Memorial Dr., Cambridge.
Heels, George E., Major, 2 Longfellow Road, Cambridge.
Hester, James W., Capt., 120 Winter St., Clinton.
Hurley, Daniel J., Lt. Col., 85 Langley Rd., Newton.
Hurwitz, A., Major, 27 Allenwood St., West Roxbury.
Joslin, Allen P., Major, 81 Bay State Rd., Boston.
Leavitt, Benjamin, Major, 857 North Main, Fall River.
Levine, David I., Capt., 17 Front St., Weymouth.
Oberson, Henry J., Lt. Col., 93 Eastern Ave., Lynn.
Reid, Howard S., Lt. Col., 32 Summer St., Cohasset.
Rubino, Bernard C., Capt., 4 Maple St., Baldwinsville.
Schuler, James D., Capt., New England Sanitarium & Hosp., Stoneham.
Stalk, Theodore, Major, 62 Curtis St., Egypt.

Michigan

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Bronson, William W., 1st Lt., 306 Mill St. Penckney.
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Diack, Samuel L., Lt. Col., 4220 S.W. Greenleaf Rd., Portland.
Gantenbein, C. E., Major, 2824 N.W. Santanita Terrace, Portland.
Huntington, William H., Col., 651 North Monroe, Portland.
Sleeter, Robert W., Capt., 1715 E. Main St., Medford.

PHYSICIANS SEPARATED FROM SERVICE

Name	Rank	Address

Pennsylvania

Abramson, M.	Capt.	5601 Woodbine Ave., Philadelphia.
Amsterdam, Julius	Capt.	1146 W. Venango St., Philadelphia.
Anderson, Joseph B.	Major	2915 Belrose Ave., Pittsburgh.
Barrett, John B.	Major	126 Fairfield Ave., New Castle.
Benjamin, K. W.	Capt.	1838 W. Venango St., Philadelphia.
Boben, Wm. R. A.	Major	318 S. Franklin St., Wilkes-Barre.
Bondi, Frank R.	Capt.	Greenock.
Breakstone, Edgar O.	1st. Lt.	5629 Darlington Rd., Pittsburgh.
Bresler, Rubin R.	Lt. Col.	Nine East Fourth St., Emporium.
Campbell, John H.	Capt.	141 S. Wyoming St., Hazleton.
Caplan, Paul S.	Capt.	5898 Hobart St., Pittsburgh.
Check, Frank E.	1st Lt.	652 N. Main St., Wilkes-Barre.
Dickey, Robert F.	Capt.	131 E. Church St., Lock Haven.
DeLuca, Charles Q.	Lt. Col.	1641 S. Broad St., Philadelphia.
Dilcher, Robert H.	Capt.	312 S. 17th St., Allentown.
Dougherty, Francis M.	Capt.	320 W. White St., Summit Hill.
Ewing, Agnew R.	Major	West Grove.
Feather, Harry E.	Col.	1428 Greyston Dr., Pittsburgh.
Forster, Hans W Jr.	Major	6820 Mower St., Philadelphia.
Gardner, Weston D.	Capt.	St. Francis Hosp., Pittsburgh.
Gordon, Burgess L.	Lt. Col.	1832 Spruce St., Philadelphia.
Gordon, Jacob M.	1st Lt.	4623 N. Broad St., Philadelphia.
Gordy, Samuel T.	Major	4312 Spruce St., Philadelphia.
Grant, John R.	Capt.	324 Bailey Ave., Pittsburgh.
Grazier, H. F.	Capt.	St. Christopher's Hosp., Philadelphia.
Hall, James B.	Major	360 Stony Creek St., Johnstown.
Harris, Harold B.	Major	Allegheny & Howard St., Bellefonte.
Hanlon, Frank R.	Lt. Col.	188 S. Franklin St., Wilkes-Barre.
Hendricks, C. S.	Col.	404 E. Wopsey, Wehnwood, Altoona.
Hohman, George C.	Capt.	505 Garfield Square, Pottsville.
Hoyt, Dorsey R.	Capt.	Worthington.
Humphrey, Harold I.	Major	Slippery Rock.
Ingoldsby, Eugene C.	Major	502 4th Ave., Juniata, Altoona.
Jones, Robert T.	Capt.	Harford.
Katz, Jacob	Capt.	1807 S. Sixth St., Philadelphia.
Kaufman, A. S.	Lt. Col.	6715 Wyncote Ave., Philadelphia.
Keller, David H.	Lt. Col.	55 Broad St., Stroudsburg.
Kimmich, John M.	Capt.	505 Lancaster Pike, Haverford.
Kinney, Harold J.	Major	145 E. Main St., Ligonier.
Kissell, DeWitt C.	Capt.	7004 Lemington Ave., Pittsburgh.
Kolbe, Joseph T.	Major	115 W. Miller St., New Castle.
Leinbach, Irwin S.	Major	525 Weiser, Reading.
Lucchesi, Pascal F.	Lt. Col.	4000 N. Front St., Philadelphia.
McCarthy, William C.	Major	8 Sterrett St., Crafton.
Masland, Richard L.	Capt.	222 S. 39th St., Philadelphia.
Milburn, Robert E.	Capt.	Dixmont Hosp., Dixmont.
Miles, George H.	Capt.	406 Jackson St., Gallitzin.
Montgomery, C. C.	Capt.	924 S. Franklin St., Wilkes-Barre.
Moyer, Stanley M.	Capt.	519 Juniper St., Quakertown.
Neff, Martin H.	Capt.	441 E. Lancaster Ave., Downington.
O'Keefe, John J.	Major	Levering Mill & Ott Rd., Cynwyd.
Osterhout, Franklin F.	Lt. Col.	7301 N. 21st St., Philadelphia.
Palmisano, Vincent S.	Capt.	Methodist Hosp., Philadelphia.
Patton, T. E.	Major	154 Watkins Ave., Bellevue, Pittsburgh.
Perloff, William H.	Capt.	506 Arbutus St., Philadelphia.
Pillsbury, Donald M.	Col.	12 East Amherst Rd., Bala-Cynwyd.
Plumer, Joseph N.	Capt.	State Branch, Cresson.
Ramsey, James P.	Major	1528 Christian St., Philadelphia.
Ravdin, Isidor S.	Brig. Gen.	3400 Spruce St., Philadelphia.
Remley, Luke K.	Capt.	477 West Market St., York.
Rogel, Louis F.	Major	R.D. 1, Masontown.
Romejko, Walter J.	Capt.	687 Cricket Ave., Ardmore.
Rossman, Bernard	Capt.	5603 Woodcrest Ave., Philadelphia.
Sahl, Henry G.	Capt.	5700 Whitby Ave., Philadelphia.
Schein, G. C.	Lt. Col.	331 Pennsylvania Blvd., Mt. Lebanon.
Schiff, Bencel L.	Major	5758 Pemberton St., Philadelphia.
Schreiner, G. R.	Major	30 W. Broad St., West Hazleton.
Schultz, Samuel K.	Lt. Col.	247 East 3rd St., Lewistown.
Shaffer, Robert L.	Major	272 Main St., Brookville.
Siegel, Bernard	Capt.	1329 W. Clearfield St., Philadelphia.
Siegel, John M.	Capt.	305 N. Main St., Butler.
Smith, Clyde F.	Capt.	2218 St. James St., Philadelphia.
Smith, James F.	1st. Lt.	405 E. Market St., Clearfield.
Smith, J. W.	Capt.	1600 Darby Rd., Brookline, Upper Darby.
Sniscak, John M.	Capt.	319 E. Lehigh St., Philadelphia.
Soults, Eggelton C.	Major	N. Main St., Ext. Washington.
Spritzler, Ramon J.	Capt.	6151 N. 16th St., Philadelphia.
Steinberg, Martin R.	Lt. Col.	1920 Pine St., Philadelphia.
Thorner, M. W.	Major	1911 Wynnewood Rd., Philadelphia.
Walker, Arthur M.	Major	Route 5, West Chester.
Weest, Harry W.	Lt. Col.	1907 8th Ave., Altoona.
Weigel, John E.	Major	1431 Termon Ave., Pittsburgh.
Wennersten, Jack R.	Capt.	15 S. Rohland St., Pottstown.
Weyand, James G. M.	Lt. Col.	1280 Park Place, Beaver.
White, Joseph W.	Lt. Col.	1534 N. Wash. Ave., Scranton.
Wible, Harvey G.	Major	130 7th St., Monessen.
Zehfuss, Paul E.	Lt. Col.	4403 Center Ave., Pittsburgh.

Rhode Island

Mahoney, William A.	Lt. Col.	44 Montague St., Providence.
Rego, R. P. C.	Capt.	103 Governor St., Providence.

South Carolina

Barnwell, E. H.	Lt. Col.	Wadmalaw Island, Charleston Co.
Blank, Henry S.	Major	613 Henderson St., Columbia.
Booker, John P.	Major	607 E. Main, Walhalla.
Durst, George G.	Col.	329 Hampton Ave., Greenwood.
Fair, Charles H.	Lt. Col.	14 Manly St., Greenville.
Marcus, Hyman	Capt.	Eutawville.
Marshall, James M.	Major	1405 9th Ave., Conway.
Mays, Lane E.	Capt.	Greenville General Hosp., Greenville.
Parks, Richard H.	Major	Cross Hill.
Pope, Madison R.	Major	Roper Hospital, Charleston.
Smith, Charles Capers	1st Lt.	30 Council, Charleston.
Smith, George C.	Major	312 Cherokee Rd., Florence.
Smith, Hugh P.	Lt. Col.	206 W. Earle Str., Greenville.
Stone, John T.	1st Lt.	Greenwood.
Teague, Martin M.	Major	148 Morland Ave., Laurens.
Vunk, Raymond H.	Major	166 Queen St., Charleston.
Webb, John K.	Major	Great Falls.
Whitworth, Clyde W.	Major	779 Glendalyn St., Spartanburg.
Zalin, Jacob	Capt.	Walterboro.

South Dakota

Sixbury, Carl E.	Lt. Col.	Hot Springs.

Tennessee

Bolling, Harlis O.	Lt. Col.	Kingsport.
Burrus, Roger B.	Capt.	3911 Gallatin Rd., Nashville.
Byrd, Benjamin F. Jr.	Capt.	Granny White Rd., Nashville.
Carpenter, George K.	Lt. Col.	Gateway Lane, Nashville.
Cobb, Malcolm F.	Capt.	Concord.
Deere, Charles J.	Major	John Gaston Hospital, Memphis.
Dozier, Robert L. Jr.	Capt.	2405 Westwood Ave., Nashville.
Elliott, Philip C.	Major	1108 Eastdale Ave., Nashville.
Estes, Harry M.	Capt.	4020 Aberdeen Rd., Nashville.
Fowler, Shelton F.	Capt.	627 Woodland St., Nashville.
Householder, Charles H.	Major	Baptist Hosp., Memphis.
Hufstedler, Fred E.	Major	Lenoir City.
Jones, Sam O.	Major	2714 Callatin Rd., Nashville.
Monroe, Harmon L.	Capt.	124 Elm St., Erwin.
Phillips, Walter A.	Lt. Col.	Arlington.
Runkle, William A.	Lt. Col.	802 N. Trezevant, Memphis.
Schiffler, Harry K.	Capt.	Vanderbilt Univ. Hosp., Nashville.
Swingle, Hugh F.	Major	601 E. Unaka Ave., Johnson City.

Texas

Abney, Thomas B.	Capt.	Box 128, Overton.
Allison, Joe M.	Major	P.O. Box 117, Emory.
Austin, Dale J.	Major	4605 Bowser Ave., Dallas.
Baden, Erwin E.	Capt.	493 E. Hidalgo, Raymondville.
Balko, Andrew J.	Lt. Col.	2616 San Diego St., El Paso.
Bass, James W.	Col.	415 Parland Place, San Antonio.
Benavides, Simon I. Jr.	Major	P.O. Box 68, Thornton.
Bevil, Lamar C.	Lt. Col.	1435 Calder St., Beaumont.
Beyt, Frank J.	Capt.	3812 Lakeshore Dr., Port Arthur.
Blum, Sigmund L.	Major	812 Goodhue Building, Beaumont.
Brazda, Adolph W.	Major	Ranger.
Bruhl, Charles K.	Capt.	1706 North Blvd., Houston.
Butaud, Russell S.	Capt.	801 Lathrop, Houston.
Caton, McKee	Lt. Col.	221½ S. Main St., McAllen.
Clark, Albert I.	Major	1814 Avenue O, Galveston.
Concklin, Charles L.	Capt.	434 Indiana St., Corpus Christi.
Cowles, A. G.	Major	202 W. Kings Highway, San Antonio.
Culmer, John W.	Lt. Col.	125 W. Courtland, San Antonio.
Cunningham, Ernest S. Jr.	Capt.	924 S. Denton St., Gainesville.
De La Garza, William	Capt.	603 St. Charles St., Brownsville.
Devereux, J. M.	Capt.	Box 1715 714 W. Kansas St., Midland.
Dildy, Charles B.	Major	914 Norwood Bldg., Austin.
Dryden, Bud	Major	Sta. Hosp., Sheppard Fld.

PHYSICIANS SEPARATED FROM SERVICE

Name Rank Address

Texas—Continued

Duncan, Frank B., Major, 2047 Highes St., Amarillo.
Dupre, John D., Lt. Col., Levelland.
Edens, Clarence, Capt., Box 1613, San Antonio.
Farrar, W. P., Major, 400 S.W. Reserve Life Bldg., Longview.
Flamm, Kenneth R., Lt. Col., 801 La Salle St., Amarillo.
Gaddis, Herman W., Major, 3133 Lawnview, Corpus Christi.
Goeth, Carl F., Major, 352 Blue Bonnet Blvd., San Antonio.
Griffin, Olin A., Jr., 1st Lt., Randado.
Hamilton, Carlos R., Capt., 5111 Caroline Blvd., Houston.
Harris, Gracehus C., Capt., Navosota.
Harwood, George W., Major, 4223 Hamilton St., Dallas.
Hargis, William H., Lt. Col., 205 Camden St., San Antonio.
Heare, Louis C., Lt. Col., 3400 Sixth St., Port Arthur.
Hedges, Homer V., Capt., Hico.
Henry, Colvern D., Lt. Col., 3407 W. Commerce, San Antonio.
Hermann, Robert C., Major, 310 E. Gonzales St., Yoakum.
Herndon, Gilbert C., Major, 3901 Ryan Ave., Ft. Worth.
Hicks, Yale, Jr., Capt., 624 Patterson Ave., San Antonio.
Hild, Jack R., Major, 2810 Caroline St., Houston.
Jeter, James R., Capt., Ennis.
Johnson, Homer Baker, Capt., Western Clinic Hosp., Midland.
Johnson, Jere B., Capt., 1204 Charles St., Pampa.
Jones, Edmund D., Lt. Col., 2449 Calder Ave., Beaumont.
Kaufmann, Maurice, Capt., 3517 Fairmount Ave., Dallas.
Keating, P. M., Col., 1227 Nix Professional Bldg., San Antonio.
Kootsey, Joseph S., Capt., 901 West Alabama Ave., Houston.
Latson, Harvey H., Col., Box 504, Abilene.
Leberman, Lowell H., Major, 1710 Monroe St., Commerce.
Lively, William M., Jr., Capt., 1247 S. Marsallis, Dallas.
Lockhart, William E., II, Capt., Box 417, Alpine.
McFatridge, Keith W., Major, 1109 Harrison, Wichita Falls.
McKinney, Edgar P., Major, 138 Bailey Ave., Nacogdoches.
Marshall, Reagan M., Major, 1562 Scharpe St., Houston.
Matthews, John L., Lt. Col., 1605 Nix Prof. Bldg., San Antonio.
Merriman, George J., Jr., Capt., Baylor Hospital, Dallas.
Meyer, Walter B., Capt., Hondo.
Moet, John A., Capt., Box 81, Orange Grove.
Monsalvo, Rudolph O., Major, 216 Cornell Ave., San Antonio.
Moody, Foy H., Capt., 1611 5th St., Corpus Christi.
Moore, Robert L., Capt., 4704 Shadywood Lane, Dallas.
Osborne, Clarence F., Major, 406 S. Shaven St., Pasadena.
Price, Sidney A., Major, 308 E. Church St., Victoria.
Ryan, Glen V., Capt., 1114 E. Polk, Harlingen.
Reitz, Percy A., Major, Pittsburgh.
Rice, Albert J., Lt. Col., 1008 E. 12th St., Georgetown.
Robinson, Webber T., Capt., 130 W. 18th Ave., Houston.
Rollins, Herbert B., Major, Lampasas.
Routon, William M., Major, 1202 E. Houston, Kilgore.
Russ, Stirling E., Major, 311 Howard St., San Antonio.
Sadler, Leslie R., Lt. Col., 3400 Chateau, Waco.
Schlecte, Marvin C., Lt. Col., 215 Camden St., San Antonio.
Schneider, Martin, Capt., 1615 Avenue E, Galveston.
Schnur, Sidney, Major, 1215 Walker, Houston.
Scobee, Richard G., Capt., 1022 Medical Arts Bldg., Houston.
Seale, Everett R., Lt. Col., 3408 Ella Lee Lane, Houston.
Selke, Oscar O. Jr., Capt., 404 Woodland Ave., Houston.
Sellers, Fred W., Major, 8406 Barkley Dr., Houston.
Sharp, James C., Major, Corpus Christi.
Shotts, Chester C., Capt., Pleasanton.
Sibley, D. Jacobi, Jr., Capt., Hotel Stockton, Ft. Stockton.
Sladczyk, George, Col., 601 5th St., Med. Bldg., Port Arthur.
Smith, Nellins C., Capt., 117 E. Elm, Hillsboro.
Spezia, Joseph L., 1st Lt., St. Josephs Infirmary, Houston.
Stuart, Samuel E., Col., 507 N. Willomet, Dallas.
Talbot, George B., Major, Waskom.
Talkington, Pery C., Lt. Col., 5739 Richmond Ave., Dallas.
Trumbull, Robert A., Col., 3832 Stratford, Dallas.
Wagner, Ephraim L., Capt., 3507 La. St., Houston.
Watkins, Elbert O., Capt., Box 303, Greggton.
Westphal, Herbert M., Capt., 1000 Texas Ave., Weslaco.
White, Bennie O., Major, 1706 W. 31, Austin.
Wilkerson, Edward A., Lt. Col., 12 Chelsea Pl., Houston.
Wolf, Edward T., Lt. Col., 411 Fannin St., Houston.
Wolfe, Russell S., Lt. Col., Texas State Hotel, Houston.
Woolf, Martin P., Capt., 3001 Swiss Ave., Dallas.
Worden, Robert W., Capt., 702 8th Ave., Ft. Worth.

Utah

Larson, Rudolph V., Major, Smithfield.
Sharp, Harlow B., Major, 1963 Michigan Ave., Salt Lake City.

Vermont

Conklin, Clifford T., Jr., Capt., 14 High St., Brandon.
Fogg, Allston H., Lt. Col., 41 Clark St., Burlington.
Southworth, John D., Major, 197 Woodstock Ave., Rutland.
Walker, Lewell S., Jr., Major, 29 Pleasant St., Middlebury.

Virginia

Blackford, Staige D., Lt. Col., 1403 Hilltop Rd., Charlottesville.
Brown, A. G. III, Capt., 1135 W. Franklin St., Richmond.
Gianoulis, James T., Capt., Med. Coll. Hosp., Richmond.
Hines, Herman H., Capt., State Farm.
Hurt, Ira H., Col., 418 Greenwood Rd., Roanoke.
Jones, Joseph B., Major, 219 S. Macoy Ave., Culpeper.
McKee, John B., Major, 309 S. Stewart St., Winchester.
Nelms, Nowell D., Capt., Mathews.
Nelson, R. B., Jr., Lt. Col., 503 S. Washington St., Winchester.
Ruffin, Herbert G., Major, Chester.
Somers, Lewis F., Major, 1114 Clay St., Lynchburg.
Stratton, D. B., 1st. Lt., 827 Highland Ave., S. E., Roanoke.
Warthen, H. J., Jr., Lt. Col., 1503 Confederate Ave., Richmond.
Watts, Thomas D., Major, 816 W. Franklin St., Richmond.

Washington

Benjamin, Mac B., Major, U.S. Tacoma Hosp., Tacoma.
Cameron, Walter C., Major, 1103 Medical Arts Bldg., Tacoma.
Dodds, Gordon A., Capt., 3910 48th Place N.E., Seattle.
Friborg, Arnold E., Capt., East Sound, Orcas Island.
Fuller, Melvin F., Capt., 120 First Ave., Aberdeen.
Hindin, Herman, Capt., Ritzville.
Hoag, Leslie G., Major, 1915 Rockwood St., Spokane.
Levinson, Sol, 1st Lt., 200 21st Ave., Seattle.
Kingston, G. R., Major, Chelan County Health, Wenatchee.
Lundmark, Vernon O., 1st. Lt., 4137 21st Ave., S.W., Seattle.
McCartney, Roy C., Capt., Anacortes.
McDermott, John P., Capt., 825 Jefferson St., Chehalis.
Morgan, Harry M., Major, 2115 W. Nichols Blvd., Longview.
Read, Jesse W., Major, 800 N. C St., Tacoma.
Speer, Marvin E., Jr., Capt., 318 Cascade St., Leavenworth.
Stimpson, Edward K., Major, 729 High St., Bellingham.
Stroud, Carl W., Capt., 1323 Spring St., Seattle.
Tait, Arnold C., Capt., Rosalia.
Wright, Edwin S., Major, 3035 63d SW., Seattle.

West Virginia

Ayers, Lloyd R., Major, Pinecrest Sanitarium, Beckley.
Booher, William T., Major, 85 Fifteenth St., Wellsburg.
Bradford, William P., Lt. Col., 1201 5th St., Moundsville.
Brick, John P., Capt., 724 Indiana Ave., Charleston.
Condry, John C., Major, 2007 Kenawha Ave. S.E., Charleston.
Gates, Edmund O., Lt. Col., Grace Hospital, Welch.
Hall, Sobisca S., Lt. Col., 249 Carr Ave., Clarksburg.
Read, Jesse W., Capt., 800 N. C St., Tacoma.
Roberts, Donald R., 1st. Lt., Box 966 Elkins.

Wisconsin

Dalrymple, Richard R., Major, 5 E. 14th St., Fond du Lac.
Dricken, Hilbert N., Major, 1123 N. 44th St., Milwaukee.
Flatley, Robert E., Capt., Antigo.
Haukohl, Robert S., Major, 3935 N. Downer Ave., Milwaukee.
Hohf, Arnold H. J., Capt., 2324 Kendall Ave., Madison.
Hollenbeck, S. W., Lt. Col., 2650 W. Fond du Lac Ave., Milwaukee.
Jaastad, Leonard B., Lt. Col., 3178 N. 50th St., Milwaukee.
Krehl, William H., Capt., 1130 Sherman Ave., Madison.
Leasum, Charles, Capt., Sturgeon Bay.
Matthei, Louis P., Capt., South Wayne.
Nebel, Harold, Lt. Col., 7723 N. Boyd Way, Fox Point.
Miller, Lee E., Major, 1228 S. 54th St., Milwaukee.
Moland, Oscar G., Major, Augusta.
Rosenberg, S. W., Major, 525 E. Michigan St., Milwaukee.
Teplinsky, Louis L., Capt., 3003 N. 48th St., Milwaukee.
Twohig, David J., Lt.Col., 229 Melrose Blvd., Fond du Lac.
Vedner, Joseph H., Lt. Col., 308 11th St., Menomonie.

Wyoming

Dominick, DeWitt, Major, 1040 Eleventh St., Cody.

Puerto Rico

Aybar, Jose A., Major, 20 Gertrudis St., Santturce.

ORGANIZATION SECTION

REPORTS OF OFFICERS

NOTE.—At the 1925 session of the Association, the House of Delegates suggested that all reports of officers, committees, etc., and resolutions to be brought before the House, if available, be published in advance of the session so as to permit careful consideration and discussion.

(Continued from page 640)

REPORT OF THE BOARD OF TRUSTEES

To the Members of the House of Delegates of the American Medical Association:

The following annual report of the Board of Trustees is respectively submitted to the House of Delegates. In this report are covered the activities of various councils and bureaus of the Association during the year 1944 and, because of the lateness of the annual meeting of the House of Delegates, reference will be made to some matters that have received attention of the Board of Trustees during the current year.

Many new problems growing out of the prosecution of World War II have arisen within the last two years.

The working personnel of the Association has been greatly depleted and for many months the total number of employees was more than 200 below normal. An employment quota of 482 was imposed on the Association and for weeks at a time it was not possible to keep even this quota filled. The staffs of Councils and Bureaus were seriously reduced by the assignment of staff members to active duty with the military forces, while a large number of the clerical personnel accepted positions in government service or in industrial plants engaged in the production of war material. A considerable number of new employees served for relatively short periods. At the same time, the demands that were made on practically every department were far larger than in normal times. While the severe restrictions on paper supplies have made it difficult to maintain regular printing schedules and to produce printed material of various kinds that could have been utilized to advantage in various ways, it was also difficult to maintain employment in the printing department.

All employees who were assigned to military duty were assured that their positions would be kept open for them, but it has been practically impossible to secure replacements to serve during the war emergency who might be retained for service after the termination of the war.

Income and Expenditures

The official report of the Treasurer and the Association's auditors are appended as a part of this report of the Board of Trustees.

In 1944, as in the previous year, there was a distinct increase in income from all sources over expenditures. Net income in 1944 was $933,091.34, exceeding the income of 1943 in the amount of $214,217.58.

Total wages and salaries for the year 1944 amounted to $1,255,400.84 as compared with $1,202,472.14 in 1943. While it was necessary to increase both salaries and wages in 1944, the total expenditure for these purposes would have been much larger had it not been for a serious depletion in the number of employees.

The cost of supplies was considerably larger than in the previous year. Expenditures for various services were also larger than in 1943. Had wages and salaries and the cost of supplies and services been maintained at the normal employment level, the net gain in 1944 would have been radically reduced.

Income from investments in 1944 was $98,494.04 as compared with $82,744.08 in 1943. Even though the income from this source exceeds similar income in 1943 by more than $15,000, the Board of Trustees encountered great difficulty in finding satisfactory investments. Interest rates have been maintained at lower levels than in previous years, and it seems apparent that low interest rates will be maintained for a long time to come. However, the Board has attempted to keep idle funds invested to the fullest possible advantage, and it is gratifying to note that in spite of the nature of the existing situation with respect to investments and interest rates a larger interest return was realized in the past year.

Income from subscriptions to the Association's publications amounted to the sum of $1,303,043.68, while in 1943 the subscription income was $1,235,677.33. Advertising income in 1944 amounted to $1,707,232.10, while in 1943 the sum realized from this source was $1,366,659.10. The income from these two sources was unexpectedly large and there can be no assurance that such income can be maintained at the same level in succeeding years.

Expenses involved in the conduct of the work of the Councils, Bureaus and Committees in 1944 amounted to $459,740.12 as compared to $432,895.96 in the preceding year.

A new item appearing in the Auditor's Report is that pertaining to the cost of the employees' group annuity plan, initiated in 1944, amounting to $122,354.47.

The cost of publication of the Association's periodicals was $1,730,400.70 as compared to $1,628,969.06 in 1943. There was a slight increase in the costs involved in the maintenance of the building, machinery, type and factory equipment, furniture and office equipment. The excess of costs in 1944 over 1943 resulted from increases in wages and salaries and increased cost of paper supplies, engraving, ink, building expense, insurance and taxes, editorials, news and reporting, first class postage, subscription and advertising commissions, group hospital and life insurance and the employees' annuity plan. Excess of income over 1943 is accounted for almost entirely by unusual increases in receipts from subscriptions and advertising and from income on investments.

Dr. Edward M. Pallette

Dr. Edward M. Pallette represented the California Medical Association in the House of Delegates of the American Medical Association at eight annual sessions. In June 1942 he was elected by the House of Delegates to serve as a member of the Board of Trustees of the Association. Throughout his professional career Dr. Pallette was earnestly and actively interested in the affairs of the county medical society and the state medical association of which he was long a member as well as in the welfare of medical institutions in his state and civic affairs in his own community. He was signally honored on many occasions by assignment by his fellows to the highest posts of service, in all of which he served with fidelity and distinguished efficiency.

Death came suddenly to Dr. Pallette in Chicago on Nov. 16, 1944, where he had come to attend an official meeting of the Board of Trustees.

By his willingness to play his full part in the performance of the duties assigned to the Board, his unfailingly courteous and friendly bearing, his tolerance for the opinions and convictions of others as well as his strict adherence to every principle which he believed to be right, Dr. Pallette won and held the respect and affection of all with whom he was associated during his service as an officer of the Association. He will be long remembered as a good and faithful servant of American medicine.

Appointment of Dr. Robert A. Peers

Dr. Robert A. Peers, a delegate of the California Medical Association, was appointed, in conformity with the provisions of the Constitution and By-Laws, to fill the vacancy on the Board of Trustees created by the death of Dr. Edward M. Pallette. The service of Dr. Peers under this appointment will continue until his successor is elected by the House of Delegates.

Cooperative Medical Advertising Bureau

The Cooperative Medical Advertising Bureau serves thirty-five journals published by constituent medical associations. The Advisory Committee to the Bureau is composed of seven members, four of whom were appointed on nominations submitted to the Board of Trustees by editors of the state medical journals. Those so appointed are Drs. John S. Bouslog, E. M. Shanklin, L. Fernald Foster and Stanley B. Weld. The other members of the Advisory Committee are Dr. Walter E. Vest, Mr. W. C. Braun and Dr. Olin West.

The financial records of the Bureau are kept by the Accounting Department and are subject to examination by the same auditors that audit the accounts of the American Medical Association. The following report of income and expense for 1944 has been so audited.

INCOME

Commissions earned	$76,452.02	
Cash discounts on $305,805.77 allowed to advertisers	14,611.53	
	$61,840.49	
Commissions returned to state journals	46,000.00	
	$15,840.49	
Expended in operation of Bureau, as itemized below	15,893.87	
Balance due A. M. A. to be deducted from 1945 earnings		$53.38

EXPENSE

Amount applicable to 1944 in accordance with statement of Dec. 31, 1943	$ 522.62
Salaries	9,030.30
Accounting departmental	2,160.00
Other departmental	50.10
Postage	392.23
Telegrams and telephone	355.81
Freight and Express	113.28
Departmental printing	385.36
Travel expense	2,157.49
Conference expense	125.00
Mercantile report service	95.81
Group annuity insurance	272.16
Office supplies	183.64
Miscellaneous and director's sundry expense	50.07
Total expense	$15,893.87

Commissions earned by the Bureau and the amount returned to cooperating journals were larger in 1944 than in any previous year. Mr. Harold L. Sandberg is director of the Cooperative Medical Advertising Bureau and secretary of the Advisory Committee.

Liaison Office

Early in the war period the Surgeon General of the United States Army established a Liaison Office in the offices of the Association, which was maintained until shortly after VJ day. The first medical officer assigned to this duty was Col. Charles G. Hutter, M. C., U. S. Army, whose recent death was greatly deplored by all who knew him. When Colonel Hutter was given a new assignment, he was succeeded as Liaison Officer by Lieut. Col. Harold C. Lueth, M. C., A. U. S., who served longest in that capacity. After Colonel Lueth was assigned to duty in the Office of the Surgeon General in Washington, Lieut. Col. Robert D. Bickel, M. C., A. U. S., became Liaison Officer and served until after Japan had surrendered and until the Liaison Office was discontinued. The Board of Trustees desires to record an expression of grateful appreciation to the three splendid medical officers assigned as Liaison Officers for their extremely helpful services and to the Surgeon General of the Army for their assignment and for the maintenance of the Liaison Office. The Board also expresses a very earnest hope that the Office of the Surgeon General realized some benefits from the operations of the Liaison Office, since it has been the desire of the Association to be as helpful as possible to all agencies of the government concerned with the prosecution of the war effort.

The Board of Trustees commends to the House of Delegates and to the Surgeon General the fine services of Col. Charles G. Hutter, Lieut. Col. Harold C. Lueth and Lieut. Col. Robert D. Bickel rendered in accord with the highest traditions of medicine and of the United States Army.

Joint Committee on Physical Fitness

The Joint Committee on Physical Fitness, a committee representing jointly the American Medical Association and the National Committee on Physical Fitness, was authorized by the House of Delegates in June 1944 following a recommendation to the House by the Board of Trustees for the creation of such a group. During the year since its establishment, the committee prepared public statements of policy concerning ways of effecting increased physical fitness. Contacts were made with the governors of the individual states urging the establishment of committees in each state and the development of programs for physical fitness. The Joint Committee on Physical Fitness cooperated with various national agencies interested in the same objectives. Much education of the public was accomplished through published addresses, editorials and the issuance of educational material to the press. The committee cooperated with various organizations which submitted programs for increasing physical fitness, particularly in the field of industry. A conference was held for the establishment of standards of physical fitness for persons of various ages, and work was in progress on the publication of manuals on physical fitness for men and women incorporating these standards.

The Congress of the United States, through failure to appropriate additional funds, brought to an end the work of the National Committee on Physical Fitness. That obviously served to discontinue as well the work of the Joint Committee. Those associated with the Joint Committee have had conferences with representatives of the Athletic Institute and other agencies leading to the ultimate formation of a foundation under voluntary auspices, to be known as the Keep Fit Foundation, which will carry on this work. At the time of their last meeting the secretaries and other officers of the state medical societies discussed the program on physical fitness and volunteered their cooperation. The Board of Trustees desires to recommend that organizations in the individual states cooperate with other agencies in furthering this work.

ADDENDA TO REPORT OF BOARD OF TRUSTEES

Report of the Committee on Scientific Research for 1944

During the year twenty-three applications were received and nineteen new grants were made, amounting in all as paid to $8,480. Sixteen grants were closed. The work under twenty-five grants made before 1944 is in progress but in several cases delayed or suspended on account of the war. During the year unused balances were refunded in the amount of $822.

The annual financial statement is presented; also lists of grants closed during the year, of pending grants from earlier years, and of grants made in 1944.

FINANCIAL STATEMENT FOR 1944

Balance, Jan. 1, 1944	$18,204.16	
Appropriation for 1944	13,700.00	
Donation to Brant Fund	500.00	
Refund, grant 574	12.23	
Refund, grant 611	55.27	
Refund, grant 625	170.73	
Refund, grant 649	6.47	
Refund, grant 654	44.22	
Refund, grant 656	133.08	
Refund, grant 669	400.00	
		$33,226.16

GRANTS AND EXPENSES PAID IN 1944

Grant 668, George Ulett	$ 250.00	
Grant 669, Hans Popper	400.00	
Grant 670, Wilbur Thomas	300.00	
Grant 671, A. M. Lassek	1,000.00	
Grant 672, Archie R. Tunturi	200.00	
Grant 673, Leo Hardt	300.00	
Grant 674, David J. Sandweiss and Thomas L. Patterson	750.00	
Grant 675, Israel Davidsohn	500.00	
Grant 676, Frederick M. Allen	500.00	
Grant 677, J. LeRoy Conel (Brant Fund)	500.00	
Grant 678, Herbert S. Kupperman	500.00	
Grant 679, Theodor E. Bratrud ($600, held in abeyance)		
Grant 680, Wilhelm Raab	500.00	
Grant 681, W. E. Garrey	500.00	
Grant 682, Helen Ingleby	500.00	
Grant 683, O. Boyd Houchin ($350, held in abeyance)		
Grant 684, Rachmiel Levine	1,000.00	
Grant 685, Daniel Glomset	500.00	
Grant 686, H. M. Weaver	280.00	
Clerical expense	600.00	
		$ 9,080.00
Balance Dec. 31, 1944		$24,146.16

Respectfully submitted.

COMMITTEE ON SCIENTIFIC RESEARCH OF THE AMERICAN MEDICAL ASSOCIATION.

N. W. JONES, Portland, Ore.
Term expires, 1949.

JOHN J. MORTON, Rochester, N. Y.
Term expires, 1948.

E. W. GOODPASTURE, Nashville, Tenn.
Term expires, 1947.

LUDVIG HEKTOEN, Chicago.
Term expires, 1946.

MARTIN H. FISCHER, Cincinnati.
Term expires, 1945.

GRANTS OF COMMITTEE ON SCIENTIFIC RESEARCH

NEW GRANTS—1944

Grant 668: George Ulett, University of Oregon Medical School, $250, electroencephalograms in experimental focal brain lesions.

Grant 669: Hans Popper, Cook County Hospital, Chicago, $400, study of liver structure in relation to function tests. Refund of $400 when grantee entered the Army.

Grant 670: Wilbur Thomas, Bowman Gray School of Medicine, $300, experimental cardiac rupture.

Grant 671: A. M. Lassek, Medical College of State of Carolina, $1,000, effect of paralysis on human pyramidal system. See grants 632, 1942, and 655, 1943.

Grant 672: Archie R. Tunturi, University of Oregon Medical School, $200, acoustic area in cortex of dog.

Grant 673: Leo Hardt, Loyola University Medical School, Chicago, $300, new gastroscope.

Grant 674: David J. Sandweiss and Thomas L. Patterson, Wayne University College of Medicine, $750, relation of the endocrine glands to urogastrone.

Grant 675: Israel Davidsohn, Mount Sinai Hospital, Chicago, $500, problems of Rh factor.

Grant 676: Frederick M. Allen, New York, $500, studies on refrigeration surgery and treatment. See grant 657, 1943.

Grant 677: J. LeRoy Conel, Harvard Medical School, $500, postnatal development of the human cerebral cortex (Charles A. Brant Fund).

Grant 678: Herbert S. Kupperman, University of Georgia, $500, pregnancy test.

Grant 679: Theodor E. Bratrud, University of Minnesota Medical School, $600, colored illustrations for article on congenital adrenal hyperplasia.

Grant 680: Wilhelm Raab, University of Vermont College of Medicine, $500, protective effect of thiouracil against the toxic cardiovascular action of epinephrine and sympathin.

Grant 681: W. E. Garrey, Vanderbilt University School of Medicine, $500, innervation of the heart of vertebrates.

Grant 682: Helen Ingleby, Woman's Medical College of Pennsylvania, $500, problems of cystic disease and carcinoma of the breast.

Grant 683: O. Boyd Houchin, Loyola University Medical School, $350, vitamin E deficiency in relation to cardiac function.

Grant 684: Rachmiel Levine, Michael Reese Hospital, Chicago, $1,000, secretion and metabolism of progesterone in threatened abortion.

Grant 685: Daniel J. Glomset, Des Moines, Iowa, $500, cardiac conduction. See grant 629, 1942.

Grant 686: H. M. Weaver, Wayne University College of Medicine, $280, production and treatment of alloxan diabetic coma in rats.

STATE OF GRANT-AIDED WORK

1. GRANTS CLOSED DURING THE YEAR

Grant 481, 1937: Warren O. Nelson, Wayne University College of Medicine, $200, synthetic androgenic substances. Refund $15.22. Nelson, Warren O.: Renewal of Sperm Formation in Hypophysectomized Rats, *Anat. Rec.* **79:** 48, 1941 (supp.); Responses of the Male Sex Accessory Organs to Androgen in Hypophysectomized and Hypophysectomized-Castrated Rats, *ibid.*, p. 75. See grant 656, 1943.

Grant 571, 1940: Joseph T. King, University of Minnesota, $280, antagonistic effect of tissues on the action of sulfanilamide. Jensen, N. K., and Nelson, M. C.: Local Sulfanilamide in Compound Fractures, *Surg., Gynec. & Obst.* **75:** 34, 1942.

Grant 591, 1940: Percival Bailey, University of Illinois, $500, effects of electrolytic lesions in the periaqueductal gray matter of the Macacus monkey. Bailey, Percival and Davis, E. W.: Effects of Lesions of Periductal Gray Matter in the Cat, *Proc. Soc. Exper. Biol. & Med.* **51:** 305, 1942; The Syndrome of Obstinate Progression in the Cat, *ibid.*, p. 307.

Grant 609, 1941: C. E. Cahn-Bronner, University of Illinois College of Medicine, $300, bacterial metabolism. Refund $79.62. Cahn-Bronner, C. E.: The Inhibitory Effect of Oxygen on Starving Pathogenic Bacteria (abstract), *Am. J. Path.* **18:** 751, 1942.

Grant 617, 1941: Mary Juhn, University of Maryland College of Medicine, $500, tests of applicability of feather germ reaction to tumor diagnosis. Juhn, Mary: Feather Germ Reaction to Urine from Patients with Cancer and Other Conditions, *Arch. Path.* **37:** 383, 1944.

Grant 619, 1941: Paul Thomas Young, University of Illinois, $500, appetites and food preferences in the rat. See grants 641, 1942, and 665, 1943.

Grant 629, 1942: Daniel J. Glomset, Des Moines, Iowa, $500, cardiac conduction—disturbances of ventricular conduction. See grant 685, 1944. Glomset, Daniel J.; Glomset, Anna T. A., and Birge, Richard F.: Morphologic Study of the Cardiac Conduction System: III. Bundle Branch Block, *Am. Heart J.* **28:** 348, 1944.

Grant 631, 1942: Leopold R. Cerecedo, Fordham University, $500, vitamin B deficiency of rats and mice. See grant 663, 1943. Cerecedo, Leopold R., and Foy, John R.: Relationship Between Protein Intake and Pyridoxine Deficiency in the Rat: The Role of Tryptophan and Cystine, *Federation Proc.* **3,** No. 1 (March) 1944; Protein Intake and Pyridoxine Deficiency in the Rat, *Arch. Biochem.* **5:** 207, 1944.

Grant 635, 1942: Reginald Fitz, Peter Bent Brigham Hospital, Boston, $200, how does hyperthyroidism begin clinically? See grant 654, 1943. Fitz, Reginald: A Panoramic View of Thyrotoxicosis, *J. A. M. A.* **125:** 943, 1944.

Grant 641, 1942: Paul Thomas Young, University of Illinois, $500, appetite and food preferences in the rat. See grants 619, 1941 and 665, 1943.

Grant 649, 1942: Arthur H. Smith, Wayne University College of Medicine, Detroit, $200, metabolism of citric acid. Refund $6.47. Class Robert N., and Smith, Arthur H.: The Skeleton as Source of Endogenous Citric Acid, *J. Biol. Chem.* **151:** 363, 1943.

Grant 654, 1943: Reginald Fitz, Peter Bent Brigham Hospital, Boston, $100, study of toxic diffuse goiter. See grant 635, 1942. Refund $44.22.

Grant 655, 1943: Arthur M. Lassek, Medical College of the State of South Carolina, $300, effect of hemiplegia on the pyramidal tract. See grant 671, 1944. Lassek, A. M.: The Human Pyramidal Tract: VIII. A Preliminary Investigation of the Effect of Hemiplegias on the Fiber Components of the Pyramids, *J. Neuropath. & Exper. Neurol.* **3:** 189, 1944; The Human Pyramidal Tract: IX. Effect of Paralysis Produced by

Cerebral Tumors on Axons of the Pyramids, *Arch. Neurol. & Psychiat.* **51:** 213, 1944; The Pyramidal Tract: A Study of the Large Motor Cells of Area 4 and the Fiber Components of the Pyramid in the Spider Monkey (Ateleus Ater), *J. Comp. Neurol.* **79:** 407, 1943.

Grant 657, 1943: Frederick M. Allen, New York Medical College, $500, problems of shock. See grants 646, 1942 and 676, 1944. Allen, F. M.: Theory and Therapy of Shock, Excessive Fluid Administration, *Am. J. Surg.* **61:** 79, 1943; Theory and Therapy of Shock, Varied Fluid Injections, *ibid.* **62:** 80, 1943.

Grant 660, 1943: Wesley W. Spink, University of Minnesota, $250, staphylococcic infection. See grant 630, 1942. Spink, Wesley W., and Vivino, J. J.: Sulfonamide-Resistant Staphylococci: Correlation of In Vitro Sulfonamide Resistance with Sulfonamide Therapy, *J. Clin. Investigation* **23:** 267, 1944. Spink, Wesley, W.; Ferris, Viola, and Vivino, Jean J.: Comparative In Vitro Resistance of Staphylococci to Penicillin and to Sodium Sulfathiazole, *Proc. Soc. Exper. Biol. & Med.* **55:** 207, 1944; Antibacterial Effect of Whole Blood on Strains of Staphylococci Sensitive and Resistant to Penicillin, *ibid.*, p. 210.

Grant 664, 1943: S. A. Thompson, New York Medical College, $550, omental grafts in the thorax. Thompson, S. A., and Pollack, B.: The Use of Free Omental Grafts in the Thorax, accepted for publication by THE JOURNAL.

Grant 665, 1943: Paul Thomas Young, University of Illinois, $300, food preferences in the rat. See grants 619, 1941, and 641, 1942. Young, Paul Thomas: Running Activity and Dietary Habit of the Rat in Relation to Food Preference; Group Self-Selection Maintenance as a Method in the Study of Food Preferences; The Balance Between Hunger and Thirst, accepted for publication in the *Journal of Comparative Psychology.* Young, Paul Thomas, and Chaplin, James P.: Food Preferences as Tested During Group Self-Selection Maintenance, A Study of Palatability and Appetite in Relation to Bodily Need, accepted for publication in Comparative Psychology Monographs.

2. WORK IN PROGRESS, 1944

Grant 479, 1937: Tracy J. Putnam, Boston City Hospital, $200, injuries to the cervical portion of the cord. This research has been suspended for the duration.

Grant 504, 1938: Wallace M. Yater, Georgetown University Medical School, $500, histopathology of "bundle branch" block.

Grants 518, 1938, and 559, 1939: Harold D. West, Meharry Medical College, $150, synthesis of *dl*-threonine.

Grant 567, 1940: Armand J. Quick, Marquette University, $275, conversion of prothrombin to thrombin. Quick, A. J.: Prothrombin Concentration of the Blood in Various Species, *Am. J. Physiol.* **132:** 239, 1941; Effect of Air Currents on Plasma Prothrombin, *Proc. Soc. Exper. Biol. & Med* **50:** 317, 1942; On the Constitution of Prothrombin, *Am. J. Physiol.* **140:** 212, 1943.

Grant 570, 1940: William H. Sweet, University of Chicago, $300, course of nerve fiber tracts of the temporal lobe.

Grant 582, 1940: Charles W. Greene, Stanford University, $500, physiology of the coronary system in monkeys. Refund $160.48.

Grant 584, 1940: Oscar V. Batson, University of Pennsylvania, $200, nystagmus.

Grant 605, 1941: Harry G. Day, Indiana University, $400, physiologic significance of zinc. Active research has been suspended for the duration.

Grant 607, 1941: Fritz Levy, Davis Memorial Hospital, Elkins, W. Va., $250, study of marrow cells.

Grant 613, 1941: Robert W. Virtue, University of Denver, $200, formation of cholic acid. [See grant 499, 1938, report for 1940.] Research suspended because grantee is in the Army.

Grant 616, 1941: Robert S. Dow, University of Oregon Medical School, $250, effects of clotting in cerebral veins. See grant 566, 1940.

Grant 623, 1942: Catharine Macfarlane, Women's Medical College of Pennsylvania, $2,500, value of periodic pelvic and breast examination in detecting cancer. Macfarlane, Catharine; Sturgis, Margaret C., and Fetterman, Faith S.: The Value of Periodic Pelvic Examination in the Control of Cancer of the Uterus, *J. A. M. A.* **126:** 877, 1944. See earlier grants.

Grant 626, 1942: Peter P. H. de Bruyn, University of Chicago, $400, study of osteogenic substance in laying birds.

Grant 644, 1942: Jacob Rabinovitch, Jewish Hospital, Brooklyn, $240, effect of heparin on thrombosis. Rabinovitch, Jacob, and Pines, Bernard: The Effect of Heparin on Experimentally Produced Thrombosis, *Surgery* **14:** 669, 1943.

Grant 648, 1942: Meyer M. Harris, New York State Psychiatric Hospital, $250, further research on muscular disease. See grant 658, 1943.

Grant 650, 1942: Tuberculosis Committee, Minnesota State Medical Association, J. A. Myers, chairman, $1,000, tuberculosis survey of Meeker County, Minn.

Grant 653, 1942: Ulrich Friedemann, Jewish Hospital, Brooklyn, $750, types of tetanus toxin. See grants 583, 1940, and 666, 1943.

Grant 656, 1943: Warren O. Nelson, Wayne University, $300, lipids in the adrenal cortex. Refund $133.08. See grant 481, 1937.

Grant 658, 1943: Meyer M. Harris, New York State Psychiatric Institute, $250, muscular disease. See grant 648, 1942.

Grant 659, 1943: Deborah V. Dauber, Michael Reese Hospital, Chicago, $446.57, atherosclerosis in the chick (Cardiac Research Fund). See grant 642, 1942. Dauber, Deborah V., and Katz, L. N.: Experimental Atherosclerosis in the Chick, *Arch. Path.* **36:** 473, 1943. Dauber, Deborah V.: Spontaneous Arteriosclerosis in Chickens, *ibid.* **38:** 46, 1944.

Grant 661, 1943: Roland K. Meyer, University of Wisconsin, $500, antihormones. McShan, W. H.; Wolfe, Harold R., and Meyer, Roland K.: Factors Affecting the Action of Antigonadotropic Sera in Immature Rats, *Endocrinology* **33:** 269, 1943.

Grant 662, 1943: Katharine M. Howell and Elta Knoll, Michael Reese Hospital, Chicago, $750, amebic dysentery. Howell, Katharine M., and Knoll, Elta: Studies on Dientameba Fragilis: Its Incidence and Possible Pathogenicity, accepted for publication in *American Journal of Clinical Pathology.*

Grant 663, 1943: L. R. Cerecedo, Fordham University, $600, vitamin B deficiencies in rats and mice. See grant 631, 1941.

Grant 666, 1943: Ulrich Friedmann, Jewish Hospital of Brooklyn, $1,500, tetanus toxins. See grants 583, 1940, and 653, 1942.

Grant 667, 1943: I. M. Tarlov, New York Medical College, $500, regeneration of cauda equina. See grant 634, 1942. Tarlov, I. M.: Autologous Plasma Clot Suture of Nerves: Its Use in Clinical Surgery, *J. A. M. A.* **126:** 741 (Nov. 18) 1944.

Report of the Committee on Therapeutic Research

The Committee on Therapeutic Research, a standing committee of the Council on Pharmacy and Chemistry, encourages scientific investigations in the field of therapeutics by providing funds for the prosecution of necessary research.

During the year 1944 the committee issued twenty-one new grants. A detailed list of these grants, together with a list of publications during 1944 and of unexpended grants made before Jan. 1, 1944, are included in this report.

During 1944 the following grants were issued:

Grant 514: Morton McCutcheon, professor of pathology, University of Pennsylvania School of Medicine, the toxicity of sulfonamides and penicillin and the mechanism of chemotaxis in leukocytes, $150.

Grant 515: Harald G. O. Holck, associate professor of pharmacology, University of Nebraska School of Medicine, the relationship of sex to drug action, $200.

Grant 516: Nellie Perry Watts, Department of Pharmacology, Woman's Medical College of Pennsylvania, methods to prolong the action of local anesthetic drugs, $250.

Grant 517: Harry Beckman, professor of pharmacology, Marquette University School of Medicine, avian malaria, $250.

Grant 518: R. H. Rigdon, professor of pathology, University of Arkansas School of Medicine, preparation of a movie film showing pathologic changes in a case of malaria, $125.

Grant 519: Gladys R. Bucher, Department of Physiology, Woman's Medical College of Pennsylvania, pepsin in the urine, $200.

Grant 521: W. F. Hamilton, professor of pharmacology and physiology, University of Georgia School of Medicine, to investigate intravascular pressures of unanesthetized animals and man, and certain problems in the field of shock and changes in the cardiac recoil curve, $125.

Grant 522: Ward J. MacNeal, director of the Laboratories of Bacteriology, New York Post-Graduate Medical School and Hospital, bacteriophage phenomena, $400.

Grant 523: Ward J. MacNeal, director of the Laboratories of Bacteriology, New York Post-Graduate Medical School and Hospital, experimental viridans endocarditis, $400.

Grant 524: Harry E. Morton, associate professor of bacteriology, University of Pennsylvania School of Medicine, necessity of bacteriostasis or bactericidal action to prevent infection in an animal body, $100.

Grant 525: Herbert Silvette, assistant professor of pharmacology, University of Virginia Medical School, the effect of low barometric pressures on kidneys previously damaged, either surgically or by drugs, $250.

Grant 526: Walter G. Crump Jr., assistant professor of surgery, New York Medical College, and Herbert E. Hollander, assistant clinical professor, City Hospital, the enzyme factors in the transplantation of fetal or infantile pancreatic tissue in the adult recipient, $200.

Grant 527: Ralph G. Janes, assistant professor of anatomy, Wayne University College of Medicine, diabetes mellitus produced by alloxan and its modification by various experimental procedures, $200.

Grant 528: Linn J. Boyd, director of medicine, and Kurt Lange, clinical instructor in medicine, New York Medical College, capillary permeability of the meninges in meningitis and meningism, $350.

Grant 529: Linn J. Boyd, director of medicine, and Kurt Lange, clinical instructor in medicine, New York Medical College, the effectiveness of physical therapeutic measures in peripheral vascular diseases, $350.

Grant 530: Louis M. Palermo, assistant professor of surgery, and Boris Pollock, clinical assistant in surgery, New York Medical College, omental grafts, $200.

Grant 531: Thomas H. McGavack, associate professor of medicine, New York Medical College, the absorption of compressed pellets of the steroid hormones, $400.

Grant 532: Thomas H. McGavack, associate professor of medicine, and Herbert Elias, New York Medical College, inulin and diodrast clearances in endocrine diseases, $250.

Grant 533: Robert S. Teague, associate professor of physiology and pharmacology, University of Alabama School of Medicine, the metabolism of diethylstilbestrol and its derivatives, with emphasis on the ratio of absorption and the distribution, fate and excretion of these drugs, $500.

Grant 534: Stephen P. Jewett, New York Medical College, the use of ammonium chloride in psychiatric disorders, $350.

Grant 535: Lloyd D. Seager, professor of pharmacology, Woman's Medical College of Pennsylvania, the pharmacology and toxicology of the diamidines, $400.

The following is a list of the investigations conducted with the assistance of grants made by the Committee on Therapeutic Research, reports of which were published during 1944:

The Diuretic Effect of Gelatin Solutions, C. E. Bridger, S. E. Smathers, C. W. Cotterman, J. T. Dameron and J. Maxwell Little: *Am. J. Physiol.* **142:** 24 (Sept.) 1944.

Plasma Retention, Urinary Excretion and Effect on Circulating Total Red Cell Volume of Intravenous Gelatin in Dogs with Diminished Plasma Volume, J. Maxwell Little and J. T. Dameron: *Am. J. Physiol.* **140:** 636 (Feb.) 1944.

Micro Glass Electrode Technic for Determination of Hydrogen Ion Activity of Blood and Other Biologic Fluids, C. Lloyd Claff and Orvar Swenson: *J. Biol. Chem.* **152:** 519 (March) 1944.

Growth and Reproduction During Chronic Exposure to Carbon Monoxide, Virginia Suhrie and A. T. Miller Jr.: *Proc. Soc. Exper. Biol. & Med.* **55:** 85, 1944.

Further Studies on the Central Nervous System Action of Benzimidazole HCl, Louis Goodman and Nancy Hart: *Federation Proc.* **3:** 73 (March) 1944.

The Diuretic Action of Benzimidazole, Louis Goodman and Nancy Hart: *Federation Proc.* **3:** 73 (March) 1944.

The U. S. P. Collaborative Digitalis Study Using Frogs (1939-1941), Lloyd C. Miller: *J. Am. Pharm. A.* (scient. ed.) **33:** 245 (Aug.) 1944.

Influence of Sex on Resistance to Ouabain in the Rat, Harald G. O. Holck and Kazuo K. Kimura: *Federation Proc.* **3,** March 1944.

Effects of Age, Sex, Castration and Interval of Time After Parturition on the Ability of the Albino Rat to Build up Tolerance to and to Detoxify Pentobarbital Sodium, Harald G. O. Holck and Donald R. Mathieson: *J. Am. Pharm. A.* (scient. ed.) **33:** 174 (June) 1944.

Digestive Tract: Intralumen Pressures, with Special Reference to Gastrointestinal Propulsion and Gastric Evacuation, J. P. Quigley: Medical Physics (Chicago, Year Book Publishers, 1944), p. 310.

Application of the "Inductograph" to the Registration of Movements, Particularly of Body Structures Such as the Pyloric Sphincter, D. A. Brody and J. P. Quigley: *J. Lab. & Clin. Med.* **29:** 863 (Aug.) 1944.

Reactions Characterizing the Oxide of 6-Methyl-6-oxy-5-chloro-1,5-bicyclouracil, Treat B. Johnson: *J. Am. Chem. Soc.* **66:** 146 (Jan.) 1944.

The Apparent Advantage of Frequently Administered Quinine in Avian Malaria Infections, Harry Beckman and Jane Smith: *J. Lab. & Clin. Med.* **29:** 43 (Jan.) 1944.

The Influence of Diet on Sulfonamide Action, Esther M. Greisheimer, Roberta Hafkesbring and Grace E. Wertenberger: *Am J. Digest. Dis.* **11:** 13 (Jan.) 1944.

Effect of Estrogens on the Testis in Hepatic Insufficiency, Thomas G. Morrione: *Arch. Path.* **37:** 39 (Jan.) 1944.

Actions of Benzedrine and Propadrine in the Control of Obesity, M. L. Tainter: *J. Nutrition* **27:** 89 (Jan.) 1944.

Acute Toxicity of Choline Hydrochloride Administered Intraperitoneally to Rats, Harold C Hodge: *Proc. Soc. Exper. Biol. & Med.* **57:** 26, 1944.

Arterial, Cerebrospinal and Venous Pressures in Man During Cough and Strain, W. F. Hamilton, R. A. Woodbury and H. T. Harper Jr.: *Am. J. Physiol.* **141:** 42 (March) 1944.

The Patterns of the Arterial Pressure Pulse, W. F Hamilton: *Am. J. Physiol.* **141:** 235 (April) 1944.

Intravenous Pyelograms in Normal and Abnormal Pregnancies, Deborah C. Leary and John P. Peters: *Am. J. Obst. & Gynec.* **46:** 803 (Dec.) 1943.

Progressive Experimental Endocarditis Lenta, Ward J. MacNeal, Martha Jane Spence and Alice E. Slavkin: *Am J. Path.* **20:** 95 (Jan.) 1944.

Progress in the Study of Experimental Endocarditis, Ward J. MacNeal, Martha Jane Spence and Anne Blevins: *New York State J. Med.* **44:** 603 (March 15) 1944.

Clinical Arrest of Bacterial Endocarditis by Bacteriostatic Agents, Particularly Penicillin, Ward J. MacNeal, Anne Blevins and Charles A. Poindexter: *Bull. New York Acad. Med.* **20:** 415 (July) 1944.

Clinical Arrest of Endocarditis Lenta by Penicillin, Ward J. MacNeal, Anne Blevins and Charles A. Poindexter: *Am. Heart J.* **28:** 669 (Nov.) 1944.

The Effect of Bromide Administered During Embryonic Development on Learning Tests in Rats, Ben King Harned, Hughbert C. Hamilton and Versa V. Cole: *Federation Proc.* **3:** 75 (March) 1944.

The Effect of the Administration of Sodium Bromide to Pregnant Rats on the Learning Ability of the Offspring: II. Maze Test, Ben King Harned, Hughbert C. Hamilton and V. V. Cole: *J. Pharmacol. & Exper. Therap.* **82:** 215 (Nov.) 1944.

The Effect of the Administration of Sodium Bromide to Pregnant Rats on the Learning Ability of the Offspring: III. Three Table Test, Hughbert C. Hamilton and Ben King Harned: *J. Psychol.* **18:** 183 (Oct.) 1944.

The Measurement of Regional Differences in the Arterial Blood Flow in the Skin, Alrick B. Hertzman: *Federation Proc.* **3:** 18 (March) 1944.

Vascular Reactions to Cold Related to the Early Stages of Immersion Foot, Kenneth E. Jochim and Alrick B. Hertzman: *Federation Proc.* **3:** 22 (March) 1944

The Effects of Cold on the Blood Vessels of the Skin of the Forearm, Kenneth E. Jochim and Alrick B. Hertzman: *Federation Proc.* **3:** 22 (March) 1944.

The Effects of Mecholyl Iontophoresis and of Reflex Thermal Dilatation on the Cutaneous Blood Flow, Walter C. Randall and Alrick B. Hertzman: *Federation Proc.* **3:** 38 (March) 1944.

Effect of Digitalis and Strophanthin on the Denervated Lymph Heart of the Bullfrog (Rana catesbeiana), Marion A. Reid: *Federation Proc.* **3:** 38 (March) 1944.

The Antidiuretic Action of Morphine and Its Mechanism, R. C. deBodo: *J Pharmacol. & Exper. Therap.* **32:** 74 (Sept.) 1944.

The following grants were issued before Jan. 1, 1944. In some cases the grant has expired and an unexpended balance remains; or the work is not yet completed, or not yet published.

Grant 232: George R. Cowgill, associate professor of physiologic chemistry, Yale University School of Medicine, the heart in vitamin B deficiency, $250.

Grant 297: Melvin Dresbach, Harvard University School of Medicine, the emetic effect of some of the digitalis bodies, $250.

Grant 306: Edwards A. Park, professor of pediatrics, Johns Hopkins University School of Medicine, rickets in the rat and the effect of solution of parathyroid on the circulation of the bone, $75.

Grant 355: Peter K. Knoefel, professor of pharmacology, University of Louisville School of Medicine, the action of amines, of the epinephrine series and of related substances on the central nervous system, $150.

Grant 408: Ephraim Shorr, associate professor of medicine, Cornell University Medical College, the effect of progesterone on the vaginal smear, $300.

Grant 412: Anne Forbes, Massachusetts General Hospital, Boston, the effect of various endocrine diseases and the administration of various endocrine products on the 17-keto-steroid secretion in the urine, $400.

Grant 430: J. P. Simonds, department of pathology, Northwestern University Medical School, the selective action of different types of poisons on the kidneys, $100.

Grant 443: A. B. Baker, associate professor of neuropsychiatry and neuropathology, and Raymond N. Bieter, professor of pharmacology, University of Minnesota Medical School, toxic effects of sulfanilamides and derivatives on nervous system and effect of vitamin B complex in prevention of such injuries, $500.

Grant 445: Paul L. Day, professor of physiologic chemistry, and John R. Totter, instructor in physiologic chemistry, University of Arkansas School of Medicine, ocular manifestations of tryptophan deficiency, $300.

Grant 449: Alrick B. Hertzman, professor of physiology, St. Louis University School of Medicine, peripheral circulation, $500.

Grant 505: James Orten, assistant professor of physiologic chemistry, Wayne University College of Medicine, to investigate the relationship of dietary protein to porphyrin metabolism in the rat, $258.

Grant 506: Andrew F. Burton, assistant professor of pharmacology, Howard University, to investigate (1) the distribution of sulfanilamide in maternal and fetal tissues at various stages of pregnancy, (2) the toxic effects of quinine on the fetus in utero, $600.

Grant 509: Thomas H. McGavack, associate professor of medicine, New York Medical College, to investigate water balance under the influence of various hormones, $350.

Grant 510: Louis S. Goodman, chairman department of pharmacology and physiology, University of Vermont College of Medicine, to investigate benzimidazole in comparison with other central nervous system depressants, $800.

Grant 511: K. A. C. Elliott, Chemical Research Laboratory, the Institute of the Pennsylvania Hospital, to investigate the effects of low and high oxygen tensions on brain metabolism, $500.

Grant 512: Essie White Cohn, associate professor of chemistry, University of Denver, the effect of sulfonamide drugs on the glycogen content of the liver of rabbits and rats, $200.

Grant 513: Ruth E. Miller, professor of bacteriology, Woman's Medical College of Pennsylvania, to investigate the relationship between immune mechanisms and bacterial respiration, $412.50.

Grant 454: Frederick H. Pratt, professor of physiology, and Marion A. Reid, instructor in physiology, Boston University School of Medicine, the effect of cardiac drugs on the denervated lymphatic hearts, $100.

Grant 457: Leland C. Wyman, associate professor of physiology, Boston University School of Medicine, the factors controlling the growth and functional efficiency of transplanted adrenal cortical tissue, $372.50.

Grant 458: George Fahr, professor of internal medicine, University of Minnesota, the effects of Lanatoside C on certain types of heart disease, $100.

Grant 459: Mary E. O'Sullivan, Bellevue Hospital, New York City, the therapeutic effect of estradiol in muscular dystrophy, $100.

Grant 472: Robert V. Brown, professor of physiology and pharmacology, the University of North Dakota, action of pilocarpine on bile secretion, $150.

Grant 473: Richard C. deBodo, associate professor of pharmacology, New York University College of Medicine, temporary and permanent effects of insulin on carbohydrate metabolism, with special reference to its effects on adrenalin hyperglycemia and liver glycogenolysis, $500.

Grant 474: Arthur C. DeGraff, professor of therapeutics, New York University College of Medicine, the effectiveness of sodium thiosulfate and sodium formaldehyde sulfoxalate in treatment of cardiac arrhythmias induced experimentally by mercurial diuretics, $400.

Grant 477: Harold C. Hodge, associate professor of biochemistry and pharmacology, University of Rochester School of Medicine and Dentistry, acute toxicity of choline, $200.

Grant 478: Stacy R. Mettier, associate professor of medicine, University of California Medical School, the rH factor in blood transfusion and other immunologic aspects of blood grouping, $400.

Grant 479: Mayo H. Soley, associate professor of medicine, University of California Medical School, treatment of patients with toxic diffuse goiter by means of radioactive iodine, $350.

Grant 483: Donald Slaughter, professor of pharmacology and physiology, Southwestern College of Medicine, to investigate the effects of sulfonamides on the regeneration of visual purple, $150.

Grant 484: Alfred Goerner, associate professor of biologic chemistry, Long Island College of Medicine, and M. Margaret Goerner, pathologist, Brooklyn Thoracic Hospital, the toxic action of carcinogenic compounds on liver tissue, $400.

Grant 488: L. R. Kaufman, director of surgery, New York Medical College, circulatory competence of the gut in cases of intestinal obstruction, $125.

Grant 489: L. R. Kaufman, director of surgery, New York Medical College, the use of enzyme mixture for dissolving slough, $100.

Grant 490: Andrew F. Burton, assistant professor of pharmacology, Howard University School of Medicine, the distribution of sulfanilamide and the toxic effects of quinine, $698.

Grant 491: Fred D. Weidman, professor of dermatology and vice dean for dermatology and syphilology, University of Pennsylvania Graduate School of Medicine, the control of dermatophytosis and value of living Bacillus subtilis cells, $500.

Grant 494: Amedeo S. Marrazzi, professor of pharmacology, Loyola University School of Medicine, to investigate sympathomimetic amines, $500.

Grant 497: E. Ross Hart, associate professor of pharmacology, Jefferson Medical College of Philadelphia, to investigate the pharmacologic properties of N-allyl-nor-morphine and related compounds, $250.

Grant 498: Linn J. Boyd, director of medicine, and Kurt Lange, clinical instructor in medicine, New York Medical College, to investigate the effect of cold in the treatment of shock, $300.

Grant 499: Joseph Litwins, clinical instructor in medicine, New York Medical College, to investigate the chemistry and hematology of blood donors, $200

Grant 502: Julian P. Maes, department of pharmacology, Dartmouth College, to investigate the part played by the red blood corpuscle concentration of the systemic circulation in the maintenance of blood pressure at different levels of vasoconstrictor tone, $150.

TREASURER'S REPORT

Report of the Treasurer of the American Medical Association for the Year Ended December 31, 1944

Investments (At Cost) as at January 1, 1944		$3,258,131.33
Bonds Purchased (At Cost)	1,666,103.99	
	$4,924,235.32	
Less:		
Bonds Called, Matured or Sold	327,384.85	
Investments as at December 31, 1944		$4,596,850.47
Balance for Investment January 1, 1944	207,900.01	
Interest Received on Investments Year 1944	102,906.10	
	310,806.11	
Bonds Purchased (At Cost plus Accrued Interest $1,013.78)	243,740.25	
Uninvested Funds December 31, 1944		67,065.86
Invested and Uninvested Funds as at December 31, 1944		$4,663,916.33

DAVIS MEMORIAL FUND

Balance in Fund January 1, 1944	$7,709.49
Interest Earned on Bank Balance Year 1944	96.66
Funds on Deposit as at December 31, 1944	$7,806.15

JOSIAH J. MOORE, M.D., Treasurer.

AUDITOR'S REPORT

January 30, 1945.

To the Board of Trustees,
American Medical Association, Chicago, Illinois.

Dear Sirs:

We have examined the balance sheet of the American Medical Association, Chicago, Illinois, as of December 31, 1944, and the statement of income for the year ended on that date, have reviewed the system of internal control and the accounting procedures of the Association and, without making a detailed audit of the transactions, have examined or tested accounting records and other supporting evidence, by methods and to the extent we deemed appropriate except as hereinafter stated regarding confirmation of receivables and observation of the inventory taking.

The cash and bank balances have been confirmed by count or by certificates from the depositaries. The United States Government and other marketable securities were confirmed by an acknowledgment from the Continental Illinois National Bank and Trust Company of Chicago where the securities are held for safekeeping.

We did not independently confirm the accounts receivable by communication with the debtors. The accounts receivable were reviewed as to age and collectibility and, in our opinion, the balances are fully realizable. We reviewed the plan and system of control adopted for inventory taking but we did not observe the taking of the inventories nor did we make tests of the physical existence of the quantities recorded.

Expenditures charged to property and equipment accounts during the year, in our opinion, were properly capitalized as representing additions or improvements. The provision for depreciation for the year appears to be adequate.

In our opinion, subject to the exceptions set forth in paragraph three, the accompanying balance sheet and related statement of income present fairly the position of the American Medical Association at December 31, 1944, and the results of the operations for the year, based on the accounting procedures employed by the Association regarding which the following observations are submitted:

(a) In accordance with the established practice of the Association, the accounts as stated do not include (a) unrecorded assets in respect of accrued interest on bond investments, and membership dues unpaid; and (b) provision for accrued property taxes for the year 1944, and sundry unpaid bills and wages.

(b) Subscriptions paid in advance are stated at an estimated amount which is based on cash received in December 1944, on account of 1945 subscriptions. This procedure conforms to the method used in prior years.

(c) Advance payments on publications include an estimated amount ($167,108.36) for prepaid subscriptions to Hygeia, and the amount ($78,065.95) received in advance for January 1945, advertising, directory information sales and service.

We have received a letter from Messrs. Loesch, Scofield, Loesch and Burke, attorneys for the Association, regarding litigation pending against the Association or its officers at December 31, 1944, which states that the case of Jean Paul Fernel ($1,000,000—libel) is pending and that in their opinion this suit will be defeated.

Fidelity insurance is carried against the undermentioned officers and employees, in the amounts stated:

Dr. Olin West, Secretary and General Manager	$10,000.00
Dr. Josiah J. Moore, Treasurer	10,000.00
E. A. Hoffman, Cashier	10,000.00
J. E. Hartigan, Assistant Cashier	2,000.00
Hiley Ward, Accountant	2,000.00
Sundry employees (sixteen, $1,000.00 each)	16,000.00
Total Fidelity Insurance	$50,000.00

We have pleasure in reporting that the books are well maintained and that every facility was afforded us for the proper conduct of the examination.

Yours truly,

PEAT, MARWICK, MITCHELL & CO.

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Income Account for the year ended December 31, 1944	"B"
	Schedule
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Expenses of Councils, Bureaus and Committees for the year ended December 31, 1944	"2"

EXHIBIT "A"

BALANCE SHEET

As of December 31, 1944

ASSETS:		
Property and Equipment—at cost:		
Land		$ 328,773.98
Buildings	$1,375,349.31	
Machinery and printing equipment	493,677.54	
Office and laboratory equipment	200,785.26	
	2,069,812.11	
Less—Reserve for depreciation	1,039,184.95	1,030 627.16
Type metal (book inventory)—at average cost		22,949.33
Total Property and Equipment		1,382,350.47
Marketable Securities—at cost (valuation based on market quotations $4,676,946.40):		
United States Government securities	3,021,255.87	
Railroad, municipal, public utility and industrial bonds	1,575,594.60	4,596,850.47
Representing investments of:		
General fund	1,921,850.47	
Association reserve fund	350,000.00	
Retirement reserve fund	525,000.00	
Building reserve fund	450,000.00	
Depreciation reserve fund	1,050,000.00	
Equipment modernization reserve fund	300,000.00	
Cash Held by Treasurer for Investment		67,065.86
Cash in Banks and on Hand		328,469.26
Accounts Receivable:		
Advertising	180,754.67	
Reprints	4,619 13	
Directory Report Service, 18th Edition	1,100.39	
Miscellaneous accounts receivable	8,484.68	194,958.87
Inventories of Materials, Supplies, Work in Progress and Publications		95,482.41
Expenditures on Publications in Progress		113,771.16
Prepaid Expenses, Deposits and Advances:		
Insurance, etc.	8,435.63	
Deposits and advances	7,135.62	15,572.25
Total		$6,794,520.75
LIABILITIES:		
Accounts Payable:		
Co-operative Medical Advertising Bureau	$ 27,630.25	
Miscellaneous	40,801.04	
Total Accounts Payable		$ 68,431.29
Subscriptions Paid in Advance		117,734.73
Advance Payments on Publications		245,174.31
Net Worth:		
Association reserve	350,000.00	
Building reserve	450,000.00	
Retirement reserve	525,000.00	
Equipment modernization reserve	300,000.00	
Capital account:		
Balance at December 31, 1943	$4,105,089.08	
Add—Net income for the year ended December 31, 1944	933,091.34	
	5,038,180.42	
Deduct — Amount transferred during year to equipment modernization reserve	300,000.00	4,738,180.42
Net Worth, December 31, 1944		6,363,180.42
Total		$6,794,520.75

EXHIBIT "B"

INCOME ACCOUNT

For the Year ended December 31, 1944

Income:		
Fellowship dues		$ 63,972.00
Income from investments		98,494.04
Miscellaneous receipts and other income		42,313.63
		204,779.67
Publications—Periodicals:		
Subscriptions	$1,303,043.68	
Advertising	1,707,232.10	
	3,010,275.78	
Costs and expenses—Schedule "1"	1,730,400.70	1,279,875.08
Books, pamphlets and reprints sold	107,738.95	
Less—Printing and other costs	63,501.85	44,237.10
Total Income		1,528,891.85
Expenses:		
Conducting Councils, Bureaus and Committees —Schedule "2"	459,740.12	
Legal and investigating	11,026.60	
Employees' group annuities	122,354.47	
Miscellaneous	2,679.32	595,800.51
Income in Excess of Expenses		$ 933,091.34

SCHEDULE "1"

PUBLICATIONS (PERIODICALS)—COSTS AND EXPENSES

For the year ended December 31, 1944

Wages and salaries	$ 826,518.54
Paper	292,797.89
Engravings and illustrations	45,895.72
Ink	18,458.05
Factory and mailing supplies	17,751.28
Repairs and renewals—machinery	5,095.30
Express and cartage	11,433.39
Power and light	14,402.14
Building expense	44,135.04
Fuel	7,834.16
Insurance and taxes	33,688.05
Editorials, news and reporting	13,815.26
Postage—first class	47,843.03
Postage—second class	62,317.78
Commissions—subscriptions and advertising	105,862.03
Discounts	67,012.28
Exchange	1,718.22
Subscription promotion expense	21,286.59
Office supplies	7,860.58
Telephone and telegrams	4,247.36
Office printing	27,173.24
Binding	2,969.45
Miscellaneous operating expenses	23,417.57
Group hospital and life insurance	9,136.49
Loss (profit) bad debts and recoveries—net	413.37
Loss on metal dross sales	611.61
	1,713,929.62
Depreciation (based on estimated remaining life):	
Buildings	$23,133.80
Machinery	13,768.50
Type and factory equipment	1,440.47
Furniture and equipment	7,411.00
	45,753.77
	1,759,683.39
Deduct—Proportion of overhead expenses charged to other publications and departments	29,282.69
Total Publications (Periodicals)—Costs and Expenses	$1,730,400.70

Note: Total wages and salaries for year 1944 amounted to $1,255,400.84. Of this amount, $826,518.54 is included above, $294,938.67 is shown in Schedule "2" (expenses of Councils, Bureaus and Committees), and the remainder, $133,943.63, was disbursed on the maintenance of records which will be used in connection with the next edition of the American Medical Directory, and with the printing of books, reprints and pamphlets, and printing in process at the close of the year.

SCHEDULE "2"

EXPENSES OF COUNCILS, BUREAUS AND COMMITTEES

FOR THE YEAR ENDED DECEMBER 31, 1944

Salaries and wages	$294,938.67
Office printing	13,287.75
Office supplies and repairs	6,108.40
Express, telephone and telegraph	5,801.96
Postage	7,791.51
Binding	577.10
Books and periodical subscriptions	869.87
Educational material distributed	5,732.09
Travel	19,760.80
Radio broadcasting	18,254.38
Inspection of hospitals and medical schools	3,915.06
Association exhibits	3,312.38
Trustees' meeting expenses	7,573.19
Consultations, investigations, tests and honorariums	11,711.05
Section secretaries' conference and honorariums	3,504.45
State secretaries' conference	6,802.72
Council and Bureau conferences	17,485.32
Committee on Scientific Research	7,758.00
Other committee expenses	8,258.58
Miscellaneous	16,296.84
Total expenses of Councils, Bureaus and Committees	$459,740.12

NOTE: The above expenses are spread over the following Councils, Bureaus and Committees as indicated: Association account, $109,719.25; Bureau of Health Education, $50,974.25; Council on Pharmacy and Chemistry, $43,694.23; Chemical Laboratory, $16,997.47; Council on Physical Medicine, $18,917.60; Council on Foods, $17,158.30; Committee on Therapeutic Research, $6,486.05; Council on Medical Education and Hospitals, $58,081.61; Bureau of Legal Medicine and Legislation, $30,723.00; Bureau of Investigation, $9,144.31; Bureau of Medical Economics, $17,557.30; Council on Industrial Health, $22,540.98; Association and Bureau of Exhibits, $18,734.59; Council on Medical Service and Public Relations, $28,712.71; Committee on Medical Preparedness, $9,698.47.

REPORT OF THE COUNCIL ON SCIENTIFIC ASSEMBLY

To the Members of the House of Delegates of the American Medical Association:

Because of the enforced cancellation of the annual session for 1945, the Council on Scientific Assembly has little else to report except that the usual Annual Conference of the Council with the Section Secretaries was held late in 1944. At that conference plans were made for the scientific program for 1945. Considerable progress had been made in the preparation of the section programs and the program for the General Scientific Meetings. The Council desires to express appreciation of the services of officers of the scientific sections and its regret that their efforts toward the preparation and presentation of good programs were made futile by the cancellation of the annual session.

The House of Delegates in 1941, after giving consideration to a resolution submitted by Dr. Henry A. Luce, delegate from Michigan, proposing that a Section for General Practitioners be established in the Scientific Assembly, requested the Council to arrange for Sessions for General Practitioners in the Section on Miscellaneous Topics, and this was done in 1942 and in 1944. The programs presented at those sessions attracted a rather large attendance, and the manner in which they were received seemed to indicate that there was a real desire for the establishment of a Section for General Practitioners. The Council on Scientific Assembly therefore recommends to the House of Delegates that such a section be established and that proper amendment be made to the By-Laws to include the new section.

Respectfully submitted.

A. A. WALKER, Chairman.
FREDERICK A. COLLER.
CLYDE L. CUMMER.
EDWARD L. BORTZ.
CHARLES H. PHIFER.
ROGER I. LEE, President-Elect.
MORRIS FISHBEIN, Editor, THE JOURNAL
OLIN WEST, Secretary.
} Ex officio.

Washington Letter

(From a Special Correspondent)

Oct. 29, 1945.

Approval of National Research Foundation by American Medical Association

A statement of Dr. Morris Fishbein, Editor of THE JOURNAL, to the joint subcommittee of the Senate Commerce and Military Affairs Committees expressed approval by the American Medical Association of the proposal to set up a National Research Foundation. Dr. Fishbein pointed out that the work of the Office of Scientific Research and Development during the war had demonstrated that federal funds could be used satisfactorily to promote research and speed medical discoveries. He warned that the foundation must avoid "bureaucratic domination of research," restrictions on research or undue support in any one field. He also opposed inclusion of social sciences in the federal program, contending that findings might be used to affect legislation and influence political opinion. The committee also heard Howland H. Sargeant, patent chief in the office of the Alien Property Custodian, ask for congressional action to prevent enemy owners from capitalizing on patients.

Controversy Over Use of Influenza Vaccine by Army

A controversy is reported between medical services here over use by the Army of a new influenza serum to vaccinate all its personnel. The navy declares that the vaccine is an "experiment" and the Public Health Service has refused to license it. The Office of the Surgeon General of the Army, nevertheless, is reported to be proceeding with plans for vaccination of every man and woman in the service at home and abroad in the belief that it will prevent an epidemic. Capt. Otto L. Burton, chief of the Navy division of preventive medicine, has stated that "nobody knows what it will do or how long it will immunize." The Public Health Service reported that commercial houses have applied for the right to manufacture the new serum but that the government has declined to license it for public use.

Need for More Psychiatrists

Dr. Karl Menninger, director of the Menninger Clinic, Topeka, Kan., told the National Health Advisory Committee of the National Federation of Business and Professional Women's Clubs that there is a high incidence of mental disease among women and stressed the need for more psychiatrists. Taking part in the program were Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service; Norman Damon of the Automotive Safety Foundation; Dr. Dorothy Nyswander, consultant in health education, Inter-American Educational Foundation, and Miss Melva Bakkie, director, Nutrition Service, American Red Cross.

Health Needs of School Age Children

A report by the Health and Physical Education Service, U. S. Office of Education, states that the health and fitness needs of school children are not being met. It contends that a community health program can be more easily and efficiently carried out while the student is in school. Health activities within the school are listed as examination, immunization and follow-up leading to corrective services, plus provision for a safe, sanitary and healthful school environment.

Plans for Disposal of Surplus Property Relating to Health

Dr. J. O. Dean of the U. S. Public Health Service was to testify on plans for disposal of surplus property relating to health, before the Kelley Subcommittee on Aid to the Physically Handicapped. Dr. H. D. Alves of the U. S. Office of Education was also authorized to describe plans for disposal of surplus educational materials. They were delegated by the Surplus Property Director to appear for him.

President's Physician to Teach in Washington

Col. Wallace Graham, appointed recently as personal physician to President Truman, is expected to join the instructional staffs of two Washington medical schools. He is already on the staff of Walter Reed Hospital.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

District Meeting.—The Fifth District Medical Society was addressed in Camden October 16 by:

Capt. Horace R. Boone (MC), Memphis, Rehabilitation of the Navy Patient.
Dr. Jacob Alperin, Memphis, Tenn., Harmful Effects of Morphine and Digitalis in Heart Disease.
Dr. Robert L. Sanders, Memphis, Tenn., The Diagnosis and Management of Obstructive Lesions of the Colon.
Vice Admiral Ross T. McIntire (MC), Medical Research in War and Peace.

At an evening public session the speakers included Governor Ben T. Laney, Arkansas, and Dr. McIntire on "War Medicine and Its Future Impact."

CALIFORNIA

County Society Considers New Home.—Members of the San Francisco County Medical Society will soon vote on the disposition of its headquarters at 2180 Washington Street, San Francisco, and the consideration of a new home. The bulletin of the society for October discusses the various aspects of the project which will be presented to the membership for vote.

School Teacher Named to Psychiatric Staff.—Miss Grace Ahrens, a school teacher, has been appointed to the staff of the child psychiatry unit of the Langley Porter Clinic of the University of California Medical School, San Francisco. The school program will be conducted for five hours each day and is being integrated with the other treatment given the mentally sick children. The school will form an important part of the treatment, since many of the children have been referred to the clinic because of behavior or other difficulties in school. With some children the school has come to be associated with painful experiences so that almost all learning is blocked, but as the child gradually reaches a better mental adjustment he also learns to accept the school situation. Some text books and the same type of treatment carried on in public schools will be used.

Funds for Tuberculosis Library.—The B. P. O. Elks Lodge Number 99 of Los Angeles has given $12,000 to the Barlow Sanatorium of Los Angeles to establish a library for research in tuberculosis. According to Dr. Howard W. Bosworth, medical director of the Barlow Sanatorium Association, this fund is intended to finance the erection of a small building and the purchase of furniture and equipment, books and medical journal subscriptions. It is hoped to build up as complete a library as possible in the field of tuberculosis and diseases of the chest. This library will be designed to serve the staff of the sanatorium, the teaching of student nurses in tuberculosis, teaching of medical students from the University of Southern California in tuberculosis, postgraduate courses for physicians in tuberculosis, and physicians or other persons in this area seriously interested in tuberculosis. The reading room of the library will be designed for use as a class room for staff meetings, committee meetings and lectures. It will be known as the Elks' Tuberculosis Library of the Barlow Sanatorium.

COLORADO

Faculty Changes at Colorado.—The following changes in status of members of the faculty at the University of Colorado School of Medicine, Denver, were recently announced: Dr. John W. Amesse, professor of clinical pediatrics emeritus, and John M. Barney, professor of medicine emeritus, both effective September 1. Dr. Arthur J. Markley was also recently made professor of dermatology emeritus. Dr. Osgoode S. Philpott was recently appointed professor and head of the department of dermatology. Other changes on the faculty include the appointments at the medical school of Dr. Robert S. Liggett as assistant professor of medicine and assistant dean and Dr. Emmett A. Mechler as assistant professor of obstetrics and gynecology.

ILLINOIS

Personal.—Dr. William F. Schroeder, Rock Island, has resigned as a member of the board of the Rock Island Chamber of Commerce because he has gone to live in California. ——Dr. Sandor Horwitz, district health officer, who has practiced medicine in Peoria for fifty years, was made a member of the "fifty year club" of the Illinois State Medical Society, September 18. —— Dr. Leslie W. Roth, Belleville, formerly assistant professor in the department of physiology and pharmacology of the University of Colorado School of Medicine, Denver, has become research pharmacologist in the department of pharmacology, Abbott Laboratories, North Chicago.

Chicago

Dr. Keefer Discusses Penicillin.—Dr. Chester S. Keefer, Wade professor of medicine, Boston University School of Medicine, spoke on penicillin at a joint meeting of the Institute of Medicine of Chicago and the Chicago Society of Internal Medicine on Friday evening October 26.

Pigeons to Be Tested for Disease.—The laboratory of the state department of health in Chicago will carry on tests of pigeons found near county institutions in an effort to determine the extent of disease that they may carry. Blood tests of 200 pigeons have shown positive reactions of pneumonia type virus in about forty per cent of the birds. Positive reaction to psittacosis was shown in a large number of birds. New tests are being made to establish whether the reaction was caused by present or past infection and whether the birds are carriers of the disease. Final results of tests will be submitted to Dr. Roland R. Cross, Springfield, state director of health, for a decision as to what will be done with regard to eliminating pigeon flocks in Chicago.

MARYLAND

Distribution of Medical Care.—The Baltimore City Medical Society and the National Physicians Committee for the Extension of Medical Service cooperated in a program on the distribution of medical care, October 5. The speakers were:

Dr. Dean Robert, Baltimore, chief, Bureau of Medical Services, Maryland Department of Public Health, The Medical Care Program in Maryland
Dr. Thomas A. McGoldrick, Brooklyn, trustee of the National Physicians Committee and Delegate to the American Medical Association (subject not announced).
Mr. Edward F. Stegen, associate administrator, National Physicians Committee, Reveille for Medicine.

MASSACHUSETTS

X-Ray Anniversary Celebration.—The New England Roentgen Ray Society will observe the fiftieth anniversay of the discovery of x-rays November 16 at the Harvard Club, Boston. Among the speakers on the program will be:

Dr. William J. Elliott, Worcester, The Use of X-Rays in Art.
Dr. Paul E. Tivnan, Beverly, Some Industrial Applications of X-Rays.
Joseph T. Walker, Ph.D., Boston, The Application of X-Rays to Crime Detection.
Bertram E. Warren, Sc.D., Cambridge, X-Rays as a Tool of the Physicist.
Dr. Merrill C. Sosman, Boston, X-Rays in Medicine.

MICHIGAN

Institute of Industrial Health.—The Detroit Industrial Safety Council will sponsor an institute of industrial health, hygiene and nursing at the Rackham Building, Detroit, November 6-7 in conjunction with the Michigan Association of Industrial Physicians and Surgeons, Michigan Department of Health, Michigan State Medical Society, Michigan Industrial Hygiene Association, Detroit Department of Health, Wayne County Medical Society and the Detroit Industrial Nurses Association. The speakers will include:

Gordon C. Harrold, Ph.D., Detroit, DDT and Its Mixtures.
William Fredrick, Sc.D., Detroit, Soldering and Brazing Health Problems.
Marguerite F. Hall, Ph.D., Ann Arbor, Application of Public Health Statistical Methods of Health and Safety in the Factory.
Dr. Thomas Francis Jr., Ann Arbor, Upper Respiratory Infections.
Harry E. Miller, B.S., Ann Arbor, Application of Sanitary Engineering Principles to Industrial Health and Safety.
Don D. Irish, Ph.D., Midland, Volatile Solvents in Industry.
Dr. John W. Hirshfeld, Detroit, The Place of Chemotherapy in the Treatment of Traumatic Wounds.
Dr. Frank T. McCormick, Detroit, Surgical Drainage.

One session will be devoted to a symposium on heart disease as related to occupation and one on low back pain.

MINNESOTA

Association of Coroners.—The Minnesota Association of Coroners elected Dr. John W. Ekblad, Duluth, president of the organization at their annual meeting in St. Paul recently. Drs. Edwin A. Kilbride, Worthington, was made first vice president, Reino H. Puumala, Cloquet, second vice president and Russell R. Heim, Minneapolis, secretary-treasurer.

Illegal Practitioner. — Godfried Fruitiger, chiropractor, Wilton Junction, Iowa, was arrested July 25 at Pine Island for practicing healing without a basic science certificate. On July 26 he pleaded guilty to a charge of violating the basic science law and was sentenced to six months in the county jail. Sentence was stayed on condition that Fruitiger refrain from practicing healing in Minnesota. Fruitiger was practicing in a trailer at Pine Island and admitted having treated 12 patients before he was arrested. He made no direct charge for service, but patients left a "gift" of $1.

Course in Pediatrics. — The University of Minnesota Medical School, Minneapolis, announces the first of a series of continuation courses in pediatrics for pediatricians November 7-10. Faculty for the first course will include:

Dr. Irvine McQuarrie, Minneapolis, University of Minnesota Medical School.
Dr. Henry F. Helmholz Jr., Rochester, Mayo Foundation.
Dr. Helen B. Taussig, Baltimore, Johns Hopkins University School of Medicine.
Dr. Hugh McCulloch, St. Louis, Washington University School of Medicine.
Dr. Milton J. E. Senn, New York, Cornell University Medical College.
Dr. Charles A. Aldrich, Rochester, Mayo Foundation.

Subjects to be covered include Convulsive Disorders, Child Psychiatry, Psychologic Measurement, Speech Problems, Psychosomatic Pediatrics, Physical and Mental Development, Congenital Heart Disease, Rheumatic State and Acquired Heart Disease.

MONTANA

Hospital News.—The Gallatin County Medical Association has given about $15,000 to the campaign for funds to build an addition to the Bozeman Deaconess Hospital; according to *Montana Health* $51,000 has been received for the addition.

Personal.—Curtis H. Waldon, Ph.D., formerly professor of pharmacology at Purdue University School of Pharmacy, has been appointed dean of the Montana State University School of Pharmacy, Missoula, to succeed Charles E. Mollett, Ph.C., who has been associated with the school since 1907, both as professor and as dean.

Tuberculosis Officers Reelected.—Dr. E. Martin Larson, Great Falls, was reelected president of the Montana Tuberculosis Association at its twenty-ninth annual meeting in Helena September 8. Other officers who were reelected include Alex Cunningham, Helena, first vice president; Dr. Paul L. Eneboe, Bozeman, second vice president; L. S. Hazard, Helena, treasurer, and Mrs. Henrietta Crockett, Helena, executive secretary.

NEBRASKA

School Radio Health Series Opens.—First of the series of school health transcriptions recently contributed to the Omaha Public Schools by the Douglas County Medical Society was heard over KOWH September 11. The transcriptions, in a series of twelve to be broadcast weekly, are made by the American Medical Association. Title of the first was "Randy Makes Good," listing reasons for good health habits. Pictured at the presentation of the transcriptions are W. H. Waite, director of curriculum, Omaha Public Schools; Dr. Herman M. Jahr, Omaha; Fred Hill, assistant to the superintendent of schools; Dr. Charles W. M. Poynter, dean of the University of Nebraska College of Medicine, Omaha; Dr. Ernest T. Manning, Omaha, director of school health services, and Dr. W. W. Bauer, Chicago, Director of the Bureau of Health Education, American Medical Association.

NEW YORK

Frank Sutton Heads Rochester Hospital.—Dr. Frank C. Sutton, assistant director of the Rochester General Hospital, has been appointed acting medical director. He will take the place of Dr. Christopher G. Parnall, Rochester, who retired September 30 after serving as medical director for twenty years. Dr. Sutton graduated at Northwestern University Medical School, Chicago, in 1938. He has been Dr. Parnall's assistant for the past three years. Dr. John E. Gillick, New York, chief resident physician, will serve as administrative assistant. Dr. Parnall will devote full time to consultation service in hospital construction.

State Medical Election—National Casualty Company Urged.—Dr. William Hale, Utica, was chosen president-elect of the Medical Society of the State of New York at the annual meeting of the house of delegates in Buffalo October 9. Dr. Edward R. Cunniffe, New York, is president. Other officers include Dr. Stephen R. Monteith, Nyack, second vice president; Dr. Walter P. Anderson, New York, secretary; Dr. W. Guernsey Frey, New York, assistant secretary; Dr. Kirby Dwight, New York, treasurer, and Dr. James R. Reuling, Bayside, assistant treasurer. A resolution was adopted urging an organization of a national casualty company to develop and promote voluntary medical insurance coverage in areas where none exists. The resolution stated that such a casualty company was necessary as an agency to relate the enrolment of nationwide employers to the various local nonprofit plans and can be organized wholly within the control of the medical profession.

New York City

Personal.—Ivan C. Hall, Ph.D., has resigned as professor and director of the department of bacteriology at New York Medical College, Flower and Fifth Avenue Hospitals, New York. THE JOURNAL, September 1, page 82, incorrectly reported that Dr. Hall was resigning from the New York University College of Medicine.

The Janeway Lectures. — Henrik Dam, D.Sc., associate member of the Rockefeller Institute for Medical Research, delivered the Edward Gamaliel Janeway Lectures at the Mount Sinai Hospital of New York, October 30-31. His subjects were "Medical Aspects of Vitamin K" and "Some Effects of Vitamin E Deficiency and Fatty Acids."

The Harvey Lecture.—Dr. Alfred Blalock, professor and director of the department of surgery, Johns Hopkins University School of Medicine, Baltimore, will deliver the second Harvey Lecture November 15 at the New York Academy of Medicine. The lecture, which will be on "Physiopathology and Surgical Treatment of Congenital Cardiovascular Defects," is the second in the series sponsored by the Harvey Society and the New York Academy of Medicine.

Conference on Chronic Pulmonary Diseases. — The thirty-fifth clinical session on chronic pulmonary diseases of the Tuberculosis Sanatorium Conference of Metropolitan New York will be held at the Cornell University Medical College Amphitheater, November 7, according to the New York Tuberculosis and Health Association. The program will include papers by Dr. Sol Roy Rosenthal, Chicago, on "Ten Years' Experience with BCG (Clinical and Experimental)" and Dr. Milton I. Levine, New York, "The Results of BCG Inoculation of Children from Tuberculosis Homes in New York City."

"X-Ray Jamborees."—October 15 marked the beginning of Harlem's chest x-ray jamborees, the highlight of a two month antituberculosis campaign in the community. Free chest x-rays are being offered during the campaign to every adult resident of Harlem, an area where tuberculosis still kills nearly ten people every week, according to the state health department. The sponsoring groups are the Central Harlem Health Center of the state department of health, the Harlem Tuberculosis and Health Committee of the New York Tuberculosis and Health Association and the Manhattan Central Medical Society.

Dr. Muckenfuss Returns. — Dr. Ralph S. Muckenfuss, New York, who commanded the first medical general laboratory in the European theater of operations and the European theater blood bank, has returned from military service to resume his position as director of the bureau of laboratories of the department of health. Dr. Muckenfuss had been on military leave since July 22, 1942. In a citation awarding him the Legion of Merit, Dr. Muckenfuss, who held the rank of lieutenant colonel, was credited with organizing the first medical general laboratory, the first organization of its type. The credit for organizing the only blood bank in the United Kingdom was also ascribed to him.

Blood and Plasma Exchange Bank.—The Medical Society of the County of New York has incorporated a nonprofit organization to make blood and plasma readily available to patients in civilian hospitals at a small cost, the New York *Times* announced October 4. The new organization will be known as the Blood and Plasma Exchange of New York Incorporated and replaces a project organized by the society four years ago which was a cooperative affair among 150 hospitals in the metropolitan area. The new corporation will have a five fold program:

To coordinate existing facilities and institutions in the New York metropolitan area for the obtaining, processing, typing, matching, transportation and supply of human blood, blood plasma and related products.

To reduce the cost and to improve and increase the supply of human blood, plasma and related products for patients in the hospitals in the New York metropolitan area.
To conduct and support research projects in the operation of human blood banks and the improvement of their procedures.
To finance the training of technical personnel for the operation of human blood banks.
To stimulate and, if desirable, to subsidize the development and operation of additional blood banks in hospitals in various regions of the metropolitan area.

Heretofore the cost of a pint of blood for transfusion has been $41, but in the new arrangement a patient may obtain a unit of processed blood or plasma without any charge if he arranges through his family or friends to reimburse the hospital bank with two units of unprocessed blood. If no blood is replaced, the charge is $15 for the unit. The New York *Times* states that grants will be sought from various foundations to permit a program of expansion and improvement. One of the purposes to which these funds will be devoted will be the establishment of a twenty-four hour a day telephone and delivery service operated through a central office where an inventory of the supplies of blood of all types, plasma and blood derivatives will be kept. The technical policies of the Blood and Plasma Exchange Bank have been determined by a board of governors consisting of the superintendents and transfusionists of the eight supplying hospitals, together with representatives of three of the receiving hospitals and the deputy commissioner of health. The board of directors of the new corporation will include eventually representatives of the county medical society, the city's health and hospital departments, the Greater New York Hospital Association and other agencies.

OHIO

Physician's Estate Goes to Library.—On the death of his widow, the entire estate of the late Dr. Frederick W. Walz, Cleveland, will go to the trustees of the Cleveland Public Library "to promote the welfare of the community."

Society Holds 101st Meeting.—The Northwestern Ohio Medical Association, said to be oldest organization of its kind in the state, held its one hundred and first meeting October 9 at the Commodore Perry Hotel, Toledo. Speakers included Dr. Edward J. McCormick, Toledo, Chairman of the Council on Medical Service and Public Relations, American Medical Association, on "What Lies Ahead for the Medical Profession," and Charles Coghlan, executive vice president of Ohio Medical Indemnity.

OREGON

State Society Collects Material on Its Service Members.—The Oregon State Medical Society is assembling documents and photographs, in addition to other pertinent material, of physicians who have participated in World War II, whether members of the society or not, to build up a record of Oregon's contribution in medical activities of the war. Before the collection is permanently deposited in the medical library, to be made available to historians, it will be turned over to a World War II History Project, which will have it arranged, analyzed and catalogued by trained personnel, with duplicate catalogue cards filed in the Oregon Historical Society, the state archives, the medical school library and probably the University of Oregon Library, the Oregon State College Library and the Portland Public Library. The Oregon World War II History Project is under the direction of competent historians, Luther S. Cressman, Ph.D., curator of anthropology and director, Museum of Natural History, University of Oregon; Mr. Lancaster Pollard, superintendent, Oregon Historical Society; Dan Clark, department of history, University of Oregon, and Miss Gladys M. Everett, War Public Services, Federal Works Agency. It is part of the national program originally initiated by the committee for the conservation of cultural resources, a national organization operating on the state level.

PENNSYLVANIA

Philadelphia

Dr. Sokoloff Named Chief of Tuberculosis Division.—Dr. Martin J. Sokoloff, acting chief of the division of tuberculosis of the department of Health, has been appointed chief of the division, according to *Philadelphia Medicine*.

The Pancoast Lecture.—Dr. Ross Golden, professor of radiology, Columbia University College of Physicians and Surgeons, New York, will deliver the fifth Henry K. Pancoast memorial lecture before the Philadelphia Roentgen Ray Society November 1. His subject will be "Some Problems in Abnormal Intestinal Physiology Associated with Peritoneal Adhesions and Ileus."

Changes at Woman's Medical College.—Among recent appointments of the faculty of the Woman's Medical College of Pennsylvania is that of Dr. Virgene M. Scherer-Wammock as clinical assistant professor of syphilology. Promotions of the faculty include:

Dr. Margaret De Ronde to clinical associate professor in psychiatry.
Dr. Mary R. Curcio to clinical assistant professor of medicine.
Dr. Mildred C. J. Pfeiffer to clinical assistant professor of medicine.
Maria Wiener, Ph.D., to assistant professor of bacteriology.
Dr. F. Marian Williams to clinical assistant professor of gynecology.

Association of Ex-Resident and Resident Physicians.—The fifty-ninth annual dinner of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital will be held on Tuesday, December 4 at the Bellevue-Stratford Hotel, Broad and Walnut streets, at 7 o'clock. The president of the association, Dr. Lyn W. Deichler, Philadelphia, will preside and act as toastmaster. Ex-residents who do not receive notices of the annual dinner are requested to send their correct addresses to the secretary, Dr. Robert C. McElroy, 133 South 36th Street, Philadelphia 4.

GENERAL

Medical Correctional Association.—The annual meeting of the Medical Correctional Association, an affiliate of the American Prison Association, will be held at the Hotel Pennsylvania, New York, November 15-16. The meeting will be a joint session with the committee on crime prevention of the American Prison Association and includes the following speakers:

Dr. Robert V. Seliger, Baltimore, Criminal Hygiene.
Dr. Frank J. Curran, New York, Group Treatment of Criminals.
Robert M. Lindner, Ph.D., Baltimore, Practical Mental Hygiene for the Prisoner.
Dr. Ralph S. Banay, New York, Wanted—An Institute of Criminal Science.
Negley K. Teeters, Philadelphia, Fundamentals of Crime Prevention.
Sophie Robison, New York, Wanted—An Index for Crime and Delinquency.

Illegal Prescriber of Narcotics.—The Bureau of Narcotics, U. S. Treasury, reports that one Kenneth M. Cruikshank has been charged with violation of the federal narcotic law, having executed twelve fictitious narcotic prescriptions in Jackson, Miss., while posing "as a physician from the Mississippi State Board of Health." The U. S. Attorney at Jackson has lodged a detainer against the defendant, who is now in the U. S. Public Health Service Hospital, Lexington, Ky., to which institution he was returned for violation of his probation in a case which originated at Detroit in January 1944. The Bureau of Narcotics states that Cruikshank's criminal record dates back to 1928, at which time he was 25 years old and addicted to narcotic drugs. His criminal record shows various sentences to the house of correction and Leavenworth penitentiary as well as commitment to the U. S. Public Health Service Hospital at Lexington for treatment for narcotic addiction.

Borden Award in Nutrition.—The American Institute of Nutrition will make this award in recognition of distinctive research by investigators in the United States and Canada which has emphasized the nutritive significance of the components of milk or of dairy products. The award will be made primarily for the publication of specific papers, but the judges may recommend that it be given for important contributions over an extended period of time. The award may be divided between two or more investigators. Employees of the Borden Company are not eligible for this honor. The formal presentation will be made at the annual meeting of the institute in the spring of 1946. To be considered for the award, nominations must be in the hands of the chairman of the nominating committee by January 15. The nominations should be accompanied by such data relative to the nominee and his research as will facilitate consideration for the award. W. E. Krauss, Ohio Agricultural Experiment Station, Wooster, Ohio, is chairman of the nominating committee.

Council Named for Eye Bank.—Seventy-five persons have been appointed to serve as members of a council sponsoring the work for the Eye Bank for Sight Restoration, Inc. The council, with Albert G. Milbank as chairman, will aid in the plan to establish a nationwide eye bank for obtaining and making available healthy corneal tissue to restore the vision of persons whose sight has been lost through disorders of the cornea. The plan which the council is sponsoring includes research, study and instruction of ophthalmologists in the delicate surgery required in performing the corneal graft operation. Fellowships which will enable advanced study in causes of corneal disorders and in methods to increase the time which corneal tissue may be preserved and made available for use

in sight restoration operations are also included in the plan. Similar to the function of blood banks in restoring exhausted blood supply, the eye bank was organized to make possible restoration of the sight of persons whose vision has been destroyed because of corneal disorders by replacement with healthy tissue from the eyes of other persons (THE JOURNAL, April 21, p. 1067).

Clinical Fellowships in Medicine.—In order to assist in providing opportunities for postgraduate education in internal medicine for medical officers discharged from the armed forces, the American College of Physicians has established a limited number of clinical fellowships in medicine for 1946. These fellowships are available for physicians honorably discharged from the armed forces who are fellows, associates or prospective candidates for associateship in the college. They are designed to provide opportunity for advanced clinical training in internal medicine or in any of its special fields. They are limited to a term of one year, may start at any time during 1946 and will not be renewable. Assurance must be provided that the applicant will be acceptable in the clinic in which he has chosen to work. The fellowship stipend will ordinarily be from $1,800 to $3,000 depending on individual circumstances. Application forms for these fellowships will be supplied on request to the American College of Physicians, 4200 Pine Street, Philadelphia 4, and may be submitted, in duplicate, at any time. Decision with respect to award of a fellowship will be made and the applicant notified of the action taken as soon as possible after receipt of the application. Dr. Francis G. Blake, New Haven, Conn., is chairman of the committee on fellowships and awards.

Comparison of War and Accident Casualties in Second World War.—The National Safety Council has prepared the following tabulation showing a comparison of wartime casualties between Dec. 7, 1941 and VJ day, August 14:

WAR CASUALTIES
(From the Army and Navy)

Killed	261,608
Wounded	651,911
Missing	32,811
Prisoners	124,194
Total	1,070,524

THE HOME FRONT ACCIDENT TOLL
(From the National Safety Council)

Killed	355,000
Injured	36,000,000

(Including 1,250,000 cases involving some permanent disability)

ACCIDENT TOLL TO WORKERS ALONE
(On and Off the Job)

Killed on the job	66,000	Total workers killed on and off the job	160,000
Killed off the job	94,000		
Injured on and off the job			15,000,000

(Including 560,000 cases involving some permanent disability)

THE TRAFFIC TOLL ALONE

Killed	94,000
Injured	3,300,000

(Including 270,000 cases involving some permanent disability)

THE TOLL IN HOMES ALONE

Killed	118,000
Injured	17,500,000

Howard Rusk Named Consultant on Physical Rehabilitation.—Col. Howard A. Rusk, M. C., has resigned from the army to serve as consultant on physical rehabilitation for the Baruch committee on physical medicine, New York. The announcement indicated that Dr. Rusk is serving the committee temporarily in an effort to apply his army experience in physical rehabilitation to the urgent civilian needs in this phase of physical medicine. The committee plans to set up a blue print for the guidance of communities in the establishment of community rehabilitation centers for service. Although the committee is not in the position to finance the construction and operation of these centers, it will, through Dr. Rusk and other authorities on rehabilitation, make up a formula for a general organization to handle the program in the various communities of the nation. The formula will contain estimates of the personnel and physical facilities required for an effective center together with the necessary administrative and professional procedures. It is estimated that there are twenty-three million persons in the United States who, through injury, disease, maladjustment or from their experiences in former wars, are in need of physical or functional rehabilitation or both. It is estimated that at present there is a backlog of one million people who are in need of such care to make them employable. There were forty-four thousand people in 1944 who had undergone such care. Their average income before such rehabilitation was started was $162 annually per person. The first year after such rehabilitation their average income was $1,750 per person. This rehabilitation work is considered the third phase of medical care, the first phase being preventive medicine and the second diagnosis and treatment. Colonel Rusk, before the war, practiced internal medicine in St. Louis and also was instructor in medicine at Washington University School of Medicine there. In December 1942 he established for the Army Air Forces at Jefferson Barracks the first rehabilitation program in the armed forces. In 1943 he was given the Lord and Taylor American Design Award for a notable contribution in the field of rehabilitation. For the past several months he has been chairman of the subcommittee on civilian rehabilitation centers of the Baruch committee.

CANADA

Medical Committee on Atomic Energy.—Chalmers J. Mackenzie, D.Sc., president of the Canadian National Research Council, Ottawa, has announced that a special medical committee has been appointed to act as general directing body on medical research in the field of atomic energy, according to *Science*. The members are Drs. Duncan Graham, Toronto; James B. Collip, Montreal, and Dr. Joseph S. Mitchell, Montreal.

LATIN AMERICA

Health Activities in Latin America.—*Latin American Medical Association Formed.*—A new inter-American organization, open to physicians from all over the hemisphere, has been formed under the name of the Latin American Medical Association. At its first meeting in Mexico City, held recently, the following officers were chosen: Drs. Juan Rafael Herradora-Ubeda, Jersey City, N. J., president; Pedro Jose Zepeda, vice president; Gonzalo Valdes, secretary; Manuel de la Torre Morali, assistant secretary, and Victorio Lorani, director. Headquarters are in Mexico City. Its object is to promote the scientific advantage of medicine through the interchange of all problems except those of a religious or political nature. It hopes to organize lectures and postgraduate courses, award prizes and honorary mention for meritorious contributions to medicine in the hemisphere and establish closer relations with North and South American medical groups. It has also taken over sponsorship of the Spanish language medical journal *El Progreso Medico* (Medical Progress), which has already been published for six years.

Colombia Plans Socialized Medicine.—According to Dr. Carlos Vera, Cucuta, a physician attached to the social welfare department of the province of Santander, Colombia, the country is planning a program of socialized medicine which will affect workers in both industry and government. The physician arrived in Miami, Fla., September 24, on a commission by the Colombian government to study social security laws in the United States, according to the *Pan American World Airways*.

Argentine-British Medical Center in Buenos Aires.—An Argentine-British Medical Center has been established in Buenos Aires, with the assistance of the British Council, to promote closer relations and to facilitate the exchange of information between the British and Argentine medical professions, according to the *British Medical Journal*. The center has a committee of honor, the twenty-two Argentinian members of which include Drs. Jose Arce, Pedro Escudero, Bernardo A. Houssay and Alfredo Sordelli. British representatives of various branches of medicine have been invited to join this committee. On the executive committee are the president of the center, Dr. Mariano R. Castex; the director, Dr. Antonio Egues; the secretary, Dr. R. Castro O'Connor; an assistant secretary, three ordinary members, and two representatives of the British Hospital in Buenos Aires.

Special Society Elections.—Recently elected officers of the Sociedade de Pediatria da Bahia, Brazil, are Drs. Eliezer Audiface, president; Arnaldo Santana, vice president, and Elisio Athaide and João Pedroza Cunha, secretaries.—Recently elected officers of the Sociedad de Pediatria de Córdoba are Dr. Juan Francisco Herrera, president; Dr. J. Nicola Beltramo, vice president; Dr. Bernardo Serebrinsky, secretary, and Horacio H. Sanchez, treasurer.

New Director of Finlay Institute.—Dr. Arturo Curbelo Hernandez, professor of bacteriology of the University of Havana School of Medicine and Pharmacy, has been appointed director of the Finlay Institute of the Americas.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 29, 1945.

The Socialist Government and the British Medical Association

The socialist government has been sobered by experiencing the responsibilities of office. The speeches of its members are full of the difficulties which confront them on the path to the promised utopia of their election addresses and differ little from the addresses made by members of the late government. This is illustrated in a speech made by Mr. Bevan, the new minister of health, as the guest of the Royal Medico-Chirurgical Association at its annual dinner. Mr. Bevan said that the framing of a national health service was a task of great perplexity and delicacy in which he invited the cooperation of the medical profession. He knew that he had to break down some suspicions, but he was distinctly optimistic and believed that before the end of another year we would have a medical service which would make Britain the envy of other nations. A nation which had achieved so much during the last six years would not fail to surmount the difficulties. The war had destroyed many hospitals, and there was a shortage of nursing staff. It was the function of the Ministry of Health to provide physicians with the best and the most modern apparatus of medicine and to enable them to use it freely in accordance with their training. The individual citizen must be free to choose his doctor; the doctor must be able to treat his patient in conditions of privacy. He regarded the general practitioner as the most important man in the medical profession. He knew that there were doctors who felt that a state medical service was likely to be too much under the control of a bureaucracy. But, though he was a socialist, he believed in industrial democracy and therefore felt that doctors as a profession must have a greater and greater voice in the management of their own services, exactly as he wanted similar power for miners, railway men and engineers. But he was going to do many unorthodox things, to try a number of experiments, in which he hoped to have the cooperation of the medical profession. It will be obvious that this declaration of policy is very different from that reported in a previous letter, in which Bevan denounced his predecessor, the conservative minister of health, for surrendering to the medical profession, although he entered into negotiation, the very thing now foreshadowed.

Dr. Charles Hill, secretary of the British Medical Association, said in reply that Mr. Bevan's human and reassuring speech encouraged confident expectations. When Mr. Bevan met the doctors he would find men no less earnest than himself for the health of the people. It had become fashionable to regard individual doctors with love and respect and doctors collectively as reactionary and opposed to the public interest. They would soon, he hoped, be able to convince yet another minister that the profession had the fullest intention and desire to cooperate in obtaining the best possible health service. But Dr. Hill did not believe that the best public interest would be served by converting an independent profession into a branch of central or local government.

Organizing the Use of Medical Films

A scientific film association was formed in 1943 for the collection, collation and distribution of scientific films and to promote their appreciation and use. In July 1944 a medical standing committee was formed under the chairmanship of Mr. McAdam Eccles, a surgeon. In cooperation with the association a catalogue of all the medical films in Britain is now being prepared, which is regarded as an important work. It will list all the medical films known to exist here and will record under each title a summary of content and critical appraisal, prepared by a panel of experts in the subject matter depicted, as well as the usual details of availability and length. As new films are completed details will be given in supplements, and films withdrawn from circulation will be noted. A comprehensive recording system is used which other countries are considering. The catalogue will probably be published part by part, and first instalments are expected toward the end of this year. The medical committee of the association has already presented eighteen films at the Royal Society of Medicine to audiences averaging over 200. A new selection devoted to specialized subjects is being planned for the autumn. A memorandum on films required to be made immediately for use in teaching is being drawn up. A letter sent out earlier in the year to the deans of medical teaching schools has brought many detailed replies, on which the memorandum will be based. The correspondence of the committee now extends overseas to organizations in Australia, Canada and the United States and to individual members in other countries.

DDT as Malaria Preventive

A new use for dichlorodiphenyl trichloroethene, which has proved so useful in the destruction of noxious insects, is predicted. Indian army medical authorities, with the cooperation of the Indian air force, are testing the possibilities of reducing malaria in India by spraying DDT from the air. The first trial was made at Delhi on the banks of the Jumma, a breeding area for mosquitoes too large to be controlled effectively by ground methods. Entomologic data collected by the Malaria Institute of India before and after spraying showed that adult mosquitoes had been reduced by as much as 50 per cent on some parts of the ground sprayed while the larvae had been destroyed over the entire area. Experiments are to be continued in other malarial areas of the country.

PARIS

(From Our Regular Correspondent)

Sept. 29, 1945.

Syphilis and Social Measures of Prevention

At a meeting of a permanent committee on social hygiene at the Ministry of Public Health Dr. Cavaillon gave the results of a study made by him and Dr. Renard on the course of syphilis from 1921 to 1944. In twenty cities the cases of primary syphilis are as follows: 1921, 2,400 cases; 1927, 900; 1931, 1,500; 1938, 600; 1941, 600; 1942, 900; 1943, 1,200; 1944, 1,400. This recrudescence of syphilis is to be explained by war and occupation. The difficult economic situation has contributed to increased clandestine prostitution, which is one of the main causes of venereal diseases. The minister of the interior, acting on a proposal of the minister of public health, has taken several measures to combat clandestine prostitution. Steps are to be taken to find out prostitutes through inquiries and controls, with frequent inspections in bars, music halls, dance halls, cabarets and other places of amusement. The sick will be sent to a hospital or clinic. Those with a profession from which they derive a normal income will not be subjected to the degrading measure of the "prostitutes' police card." They will have to submit to compulsory sanitary control at least once a week; this will include on each occasion a serologic and bacteriologic examination. The prostitutes will then receive a medical certificate, which they must always carry with them. The prostitute who will not submit to these examinations or who is too often absent from the examinations without proving a change of life can be submitted to the "police card."

The minister of public health has sent a circular to doctors, hospitals and venereal disease centers emphasizing the necessity

of intensifying the search for cases of recent and old syphilis and of the occult type. He prescribed, among other measures, the medical inspection of employees of big industrial and commercial concerns and of administration offices as well as the permanent attendance and medical control of families of patients affected with dementia paralytica. He insists on the obligation of tracing venereal diseases by compulsory medical prenuptial examination, by the two antepartum examinations and by the medical control of milk handlers, wetnurses, nurses and all persons attending children.

Trend of the Demography of Paris

Marcel Moine, statistician to the Comité National de la Défense Contre la Tuberculose has reported vital statistics for Paris and the department of the Seine.

According to the table the lowest birth rate occurred in 1939-1940 on account of the mobilization; the 1943 rate was higher but did not reach that of 1935. At the same time the mortality rate, which diminished in 1939, reached 37,207 deaths in 1944, and this with reference to a diminished birth rate, as against 34,698 in 1935. The birth rate is lower in the districts inhabited by people in good circumstances—down to 58 per 10,000 inhabitants, as against 114 per 10,000 for the entire population. As to mortality, the districts having the highest birth rate are most affected. Moreover, Mr. Moine gives a death rate of 152 per 10,000 inhabitants for the poorer districts, as against 76 for those having a fair standard of living.

Births and Deaths During Ten Years

	Paris		Seine	
Years	Live Births	Deaths, Not Including Stillborn	Live Births	Deaths, Not Including Stillborn
1935	33,047	34,698	63,734	64,596
1936	32,196	34,620	62,014	65,308
1937	31,541	33,739	61,569	63,358
1938	30,976	33,572	60,835	63,984
1939	24,864	30,155	49,543	58,035
1940	22,675	31,637	44,310	61,767
1941	25,301	35,653	48,474	69,637
1942	28,695	36,150	51,415	66,501
1943	31,035	33,097	54,767	59,610
1944	29,968	37,207	51,999	65,165
Totals	290,298	340,528	548,660	637,961
Deficit		50,230		80,301

The author contends that with some adjustments these statistics can be applied on a national scale.

In order to remedy this low birth rate, says the author, it is not enough to recommend more large families. To guarantee a sufficient natality and healthy children the level of general hygiene must be improved; healthy lodgings must be procured; social disease (such as tuberculosis) must be energetically combated. Moreover, the disappearance of underfeeding and its consequences will effectively contribute to improvement in the situation.

Death of Marc Tiffeneau

Marc Tiffeneau, whose death occurred at the age of 73, had been professor of pharmacology and medicine at the Faculté de médecine since 1926. He had been a member of the Académie de médecine since 1927 and of the Académie des sciences since 1939. In the late Society of Nations he was also a member of the Committee on International Control of Narcotic Drugs. His researches regarding general hypnotics and anesthesics and tuberculin are well known. Ouabain was discovered in his laboratory. Under the occupation he belonged to the Medical and University Resistance Movement.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, Sept. 22, 1945.

Military Medicine News

The War Department has released for publication some information about the medical assistance to the wounded Brazilian soldiers returning from Italy and treated at the Army Central Hospital of Rio de Janeiro under the direction of Col. Florencio de Abreu. The first group of evacuated soldiers arrived at Rio de Janeiro in September of last year, a little more than two months after the first contingent of troops departed from this city. Little by little more wounded soldiers arrived. Up to the date of the release, the Army Hospital has received 1,068 wounded soldiers, of which about 75 per cent are entirely cured or in course of convalescence. The remaining 25 per cent have been discharged, as they have been considered incapacitated for service. Of all the 1,068 evacuated soldiers, only 1 died at the hospital. The Brazilian Army Medical Corps has adopted all the American methods of handling the wounded soldiers.

After their discharge from service and return to civil life, some of these wounded persons will still need the care of reconditioning and rehabilitation, a task that has to be done in part by the orthopedic services of the municipal hospitals of the city of Rio de Janeiro. For this reason the surgeons of these hospitals are being prepared for this special work. The first step in preparation has been the presentation, by the Bureau of Health Information, in cooperation with the Division of Moving Pictures of the Coordinator of Inter-American Affairs, of some useful medical films prepared by the United States Army and lent by Col. Howard R. Lackay, M. C., U. S. Army, of the Brazil-United States Military Commission. The subject of the films has been explained by Lieut. Emidio S. Montenegro of the medical corps of the Brazilian army.

Drs. Alfredo Monteiro, Ernani Alves, Estellita Lins, Mazzini Bueno and several other prominent surgeons who served in the Brazilian Expeditionary Force in Italy have recently arrived from Europe. The National Academy of Medicine, the Rio de Janeiro Society of Medicine and Surgery and the Brazilian College of Surgeons have held special meetings to greet these surgeons. A few of them have read papers describing the advances of surgery in the present war, particularly at the front in Italy.

Personal

Dr. J. Barcala, associate professor of neurology at the University of Buenos Aires, spent a few days in Rio de Janeiro. At the medical department of the Bureau of Fisheries of the Ministry of Agriculture, he read a paper on the diagnosis and surgical treatment of sciatica.

Dr. I. L. Nves Manta, associate professor of clinical psychiatry at the University of Rio de Janeiro, has been elected a member of the National Academy of Medicine of this city.

Marriages

WILLIAM LADELLE HOWELL, Fort Worth, Texas, to Miss Patricia Herbst in Washington, D. C., August 20.

JAMES FRANCIS KEEGAN, Burke, Idaho, to Miss Rose Antoinette Ewald of Wytheville, Va., September 1.

GEORGE P. JONES JR., Memphis, Tenn., to Lieut. Sarah Martha Goodson at Atlanta, Ga., August 28.

ALFRED JARETZKI III, New York, to Miss Sonia Lasell in Whitinsville, Mass., August 31.

MAX M. GITLIN, Bluffton, Ind., to Miss Mary Lawson at Seattle, August 16.

THEODORE S. HOWELL, Houston, Texas, to Miss Mildred Hendrix recently.

Deaths

Henry Alexander Miller, Philadelphia; Yale University School of Medicine, New Haven, Conn., 1933; D.D.S., Evans Institute, University of Pennsylvania, in 1929; born in New Haven, Conn., Oct. 10, 1904; specialist certified by the American Board of Plastic Surgery and the American Board of Otolaryngology; diplomate of the National Board of Medical Examiners; member of the American Medical Association, College of Physicians of Philadelphia and the Philadelphia Laryngological Society; first lieutenant, medical reserve corps, U. S. Army, not on active duty; instructor in maxillofacial surgery at the University of Pennsylvania Graduate School of Medicine; chief, department of radiology, visiting oral surgeon, Philadelphia General Hospital; affiliated with the Post-Graduate, Presbyterian, Children's, University of Pennsylvania and Chestnut Hill hospitals; associate editor of the *Dental Digest;* died in the University of Pennsylvania Hospital July 14, aged 41, of acute endocarditis.

Henry Hedden, Memphis, Tenn.; M.B. in 1916 and M.D. in 1918, Queen's University Faculty of Medicine, Kingston, Ont., Canada; served in the medical corps of the Canadian army during World War I; a founder and first president of the Memphis Hospital Association and the Tennessee Hospital Association; served as president of the Southeastern Hospital Association and of the Hospital Association of the Methodist Episcopal Church, South; a charter fellow of the American College of Hospital Administrators and formerly a regent of region number six; member of the American Hospital Association and the American Protestant Hospital Association; at one time superintendent of the General Hospital in St. John, N. B., Canada; superintendent and trustee of Porter Home and Leath Orphanage; superintendent of the Methodist Hospital, where he died July 30, aged 54, of cerebral hemorrhage.

Walter Nixon Thompson ✠ Sullivan, Ind.; Rush Medical College, Chicago, 1886; one of the founders and at various times president of the Sullivan County Medical Society; has been affiliated with the Associated Anesthetists of the United States and Canada; served as a captain in the medical corps of the U. S. Army during World War I; captain, medical reserve corps, U. S. Army, not on active duty; one of the founders of the R. H. Crowder Memorial Hospital; first president of the Mary Sherman Hospital; in February 1936 was given a banquet by the Sullivan County Medical Society in recognition of his fifty years in the practice of medicine in Sullivan; died July 17, aged 80, of carcinoma of the stomach.

Albert Harold Aland ✠ Los Angeles; Western Reserve University School of Medicine, Cleveland, 1916; member of the Utah State Medical Association and the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; specialist certified by the American Board of Otolaryngology; served as demonstrator of anatomy at his alma mater; at one time on the staffs of the Charles T. Miller Hospital in St. Paul and St. Mary's Hospital in Minneapolis; formerly head of the eye, ear, nose and throat department, Thomas D. Dee Memorial Hospital in Ogden, Utah; on the staffs of the Santa Monica (Calif.) Hospital and St. John's Hospital; died July 24, aged 56, of coronary occlusion.

James Sutcliffe Hill ✠ Bellows Falls, Vt.; University of the City of New York Medical Department, 1884; health officer; honorary member of the Vermont State Medical Society; for many years secretary of the board of pension examiners for Windham County, surgeon for the Rutland Railroad and member of the New York and New England Association of Railway Surgeons, of which he had been president; on the staff of the Rockingham General Hospital; served as a member of the Rockingham Library Board for many years, part of the time as secretary of the board and in late years as president; died July 2, aged 85, of carcinoma of the stomach.

John Dickenson, Shaker Heights, Ohio; Western Reserve University Medical Department, Cleveland, 1901; member of the American Medical Association; past president of the Academy of Medicine of Cleveland; fellow of the American College of Surgeons and past governor of the board; served as chairman of the central committee of Ohio on fractures and dislocations of the American College of Surgeons; a trustee of the Cleveland Medical Library Association; assistant clinical professor of surgery at his alma mater; formerly chief of staff at St. Vincent Charity Hospital, Cleveland, where he died July 9, aged 68, of arteriosclerosis.

James A. Alexander, Indianola, Miss.; Medical College of Alabama, Mobile, 1888; veteran of the Spanish-American War; died in the Veterans Administration Facility, Memphis, July 21, aged 79, of carcinoma.

Marian Arvine-Coleman, New York; Eclectic Medical College of the City of New York, 1900; died July 22, aged 75, of cerebral hemorrhage.

Henry E. Bartling, Pacific, Mo.; Beaumont Hospital Medical College, St. Louis, 1894; member of the American Medical Association; died June 16, aged 73, of diabetes mellitus and subacute nephritis.

Alex McNeill Blue, Carthage, N. C.; Tulane University of Louisiana School of Medicine, New Orleans, 1915; member of the American Medical Association; on the courtesy staff of the Moore County Hospital; formerly part time county health officer; died July 11, aged 58, of pulmonary thrombosis.

William Alva Brady, Union City, N. J.; University of Vermont College of Medicine, Burlington, 1901; member of the American Medical Association; examining physician for the Hudson County Selective Service appeal board; served during World War I; veterans' medical examiner during World Wars I and II; formerly mayor of Union City; physician for the Hudson County Penitentiary; died in Keene, N. H., July 14, aged 69, of intestinal obstruction.

George L. Carder, Hagerstown, Md.; University of Maryland School of Medicine, Baltimore, 1891; died in the Washington County Hospital July 19, aged 81, of chronic myocarditis and bronchopneumonia.

Stephen Adelbert Craig ✠ Ontario, Calif.; College of Physicians and Surgeons, medical department of the University of Southern California, Los Angeles, 1919; served during World War I; died June 26, aged 52.

William Jordan Davis, St. Louis; St. Louis University School of Medicine, 1906; died in the Pike County Hospital, Louisiana, Mo., July 28, aged 70, of carcinoma of the stomach.

Lee O. Greene, Pea Ridge, Ark.; St. Louis College of Physicians and Surgeons, 1902; member of the American Medical Association; died in Bentonville July 4, aged 65, of cerebral hemorrhage.

Frank Tucker Hopkins, New York; College of Physicians and Surgeons, medical department of Columbia College, New York, 1885; member of the American Medical Association and the American Otological Society, Inc., for many years connected with the New York Eye and Ear Infirmary and St. Luke's Hospital; died July 5, aged 88, of pneumonia.

William James Howard, Washington, D. C.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; died in the Freedmen's Hospital July 6, aged 63, of shock following a prostatectomy.

John Robert Kennedy, DeQueen, Ark. (licensed in Arkansas in 1903); died June 10, aged 75, of cerebral hemorrhage.

Paul Duncan McGehee ✠ Mobile, Ala.; University of Alabama School of Medicine, 1910; died July 10, aged 59, of cardiorenal vascular disease.

James H. Moroney, Winchester, Ind.; Starling Medical College, Columbus, 1885; member of the American Medical Association; served as city and county health officer; on the staff of the Randolph County Hospital; died July 8, aged 89, of chronic myocardial failure.

John E. Oakley, Memphis, Tenn.; Memphis Hospital Medical College, 1900; died in the Baptist Memorial Hospital July 3, aged 65, of coronary thrombosis.

Edwin Spooner Potter, Santa Barbara, Calif.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; served during World War I; major, medical reserve corps, U. S. Army, not on active duty; died July 6, aged 75, of cerebral hemorrhage.

John William Ridenour, Ada, Ohio; Eclectic Medical Institute, Cincinnati, 1899; died July 10, aged 77, of carcinoma of the intestine.

Clement Dare Smedley, Youngstown, Ohio; Medical College of Ohio, Cincinnati, 1903; served during World War I; died July 8, aged 69, of carcinoma of the rectosigmoid.

Anna Topaz, Providence, R. I.; Tufts College Medical School, Boston, 1903; for many years on the staff of the Miriam Hospital; died June 19, aged 73, of injuries received when struck by a trolley car.

Edward Comstock Wilson, Washington, D. C.; George Washington University School of Medicine, Washington, 1907; died in Edgewater Beach, Md., July 11, aged 65, of pulmonary edema, coronary heart disease and arteriosclerosis.

Correspondence

EARLY HEALING IN FRACTURES

To the Editor:—Referring to a communication of mine published in THE JOURNAL, August 4, under the heading "Early Healing in Chronic Osteomyelitis and Compound Fractures," I have just received a letter from Col. Leonard T. Peterson, M. C., U. S. Army, on duty in the Surgeon General's Office.

Dr. Peterson calls my attention to the fact that early work along the lines I discuss was done in the Mediterranean theater by Col. E. D. Churchill, who was making some use of secondary closure in compound fracture wounds. The second point to which Colonel Peterson calls attention is that Capt. E. M. Burgess was preceded in the use of skin graft for earlier closing of such wounds by Major Robert P. Kelly, chief of the orthopedic section at Ashford General Hospital, White Springs, W. Va. Colonel Peterson says that Major Kelly discussed this method at our meeting of the American Orthopedic Association in 1944.

With regard to either primary or secondary closure of these wounds, that has been described and discussed by many surgeons ever since Chisholm of the Confederate Army advocated it during the Civil War. I am still opposed to that for the reasons that I have stated on many occasions. With regard to the skin graft covering of wound surfaces, however, that is a distinct contribution to the program I have been advocating, and I am glad to refer credit back to Major Kelly, as suggested.

H. WINNETT ORR, M.D., Lincoln, Neb.

ACUTE SECONAL POISONING

To the Editor:—I have just read with much interest the report by Wheelock and Freedman (THE JOURNAL, September 8, p. 130) under the caption "Acute Seconal Poisoning." My attention was especially arrested by the sentence which reads "A survey of the literature has failed to reveal any cases of seconal poisoning which terminated fatally."

Obviously the writers of that article, even though they may have heard of the late lamented Will Rogers, did not follow his example and "read the daily papers." Had they done so I am certain that they would have seen the news articles on the death of the noted evangelist Amy Semple McPherson, which occurred at the Leamington Hotel in Oakland, Calif., about a year ago. And I am equally sanguine that they would have noted therein the fact, established by the medicolegal autopsy performed by Dr. Gertrude Moore, that the cause of death was an overdose of sodium isoamytal, commercially known as "seconal."

I am induced to proffer this commentary since I believe it will serve to place needed emphasis on the all too frequent appearance of references to "the literature" without notation as to the thoroughness with which such search has been pursued. Likewise it serves to stress the fact that the 'scientific literature,' despite its great volume, is not all inclusive by any means, and that especially in the realm of legal medicine and toxicology a search has not been complete until it has embraced a study of the court abstracts published for each of several sections of this country, and in several foreign countries as well, and also has included a scanning of the daily, weekly and monthly secular publications, which habitually print news items or commentaries on such occurrences.

If the authors, or any other interested and qualified persons, desire the data regarding the findings in the case of Amy Semple McPherson, I am sure that such could be obtained from either the district attorney of Alameda County or from Dr. Moore.

ALBERT G. HULETT, M.D., Oakland, Calif.
Director of Laboratories, Alameda County.

A WARNING CONCERNING THE PROMISCUOUS USE OF CURARE IN POLIOMYELITIS

To the Editor:—Considerable interest has been aroused by Dr. Nicholas S. Ransohoff's preliminary report on the use of curare in 4 cases of acute poliomyelitis (THE JOURNAL, September 8, p. 129). Interest is perhaps greater in areas where the disease has reached epidemic proportions, as is true in Salt Lake City.

Despite the fact that much remains to be learned about the pharmacologic aspects of curare, particularly its effects on the central synaptic transmission, all investigators are agreed that it is a most powerful agent in causing peripheral neuromuscular paralysis and is capable of producing respiratory paralysis and death.

Kabat and Knapp (*J. Pediat.* **24**:123 [Feb.] 1944) have described the effects of anesthetic agents and beta-erythroidine on muscle hypertonicity in poliomyelitis. My own experience with the use of curare for the same purpose was reported in another connection (*Rocky Mountain M. J.* **41**:313 [May] 1944) and relief of hypertonicity was found to be transitory, as a rule, even when patients receive sufficient curare to produce complete respiratory arrest.

Curare is perhaps one of the greatest aids added to the anesthesiologist's armamentarium in recent years. While practically all observers are in agreement with regard to the low toxicity of curare when properly employed, it is a dangerous weapon in the hands of the inexperienced and untrained. Its use should be reserved for those who are familiar with its clinical and pharmacologic actions, its untoward effects and the precautions necessary to avoid them. Particularly, one should be capable of performing endotracheal intubation for administration of artificial respiration.

Curare should be administered with caution, especially to patients having respiratory embarrassment or impairment in function of the throat muscles. By its own action the drug can make it difficult or even impossible for a patient to swallow, cough or expectorate and can cause death from respiratory paralysis.

Curare should be administered only when the following conditions have been fulfilled:

1. The physician must have had experience with it and be familiar with its pharmacologic action.
2. Antidotes such as neostigmine and ephedrine should be ready for immediate use.
3. Apparatus for maintaining an adequate airway, including endotracheal equipment and oxygen, should be available, and the physician should be skilled in its employment.

SCOTT M. SMITH, M.D., Salt Lake City.
Director of anesthesiology, University of Utah Medical School.

CALAMINE AND ZINC OXIDE

To the Editor:—Capt. Paul A. Newton continues an ancient error in his communication on vesicopustular eczema (THE JOURNAL, September 8, p. 150). Referring to treatment, he mentions calamine lotion being used on the body surfaces and zinc oxide applied to the lesions of the axillas.

Calamine is zinc oxide plus some iron rust. Calamine has no virtues over zinc oxide, and many disadvantages. It would be best if calamine were removed from professional medicine. Neocalamine is a slight improvement in color but is still essentially zinc oxide. The rationale of application of zinc oxide to the human integument is the same as its rationale in utilization in wall paint—to cover.

Zinc oxide may be safely substituted for its colored form calamine or neocalamine in all formulas for the skin.

HERMAN GOODMAN, M.D., New York.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1935 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

30:1-108 (July) 1945

Dilution Curve of Activity in Arterial Blood After Intravenous Injection of Labeled Corpuscles. G. Nylin.—p. 1.
Changes in Precordial Electrocardiogram Produced by Extension of Anteroseptal Myocardial Infarction. F. F. Rosenbaum, F. N. Wilson and F. D. Johnston.—p. 11.
Measurement of Lung-to-Face Time by Amyl Nitrite. D. Gross. —p. 19.
Coarctation of Aorta: Report of 2 Cases, Relating Clinical Data to Degree of Constriction Measured at Necropsy, with Method of Standardization for Related Measurements. D. DeF. Bauer and Lalla Iverson.—p. 30.
Rupture of Ventricular Myocardium: Report of 4 Cases with Comments on Pathogenesis and on Clinical Significance of Possibility of Cardiac Rupture in Prognosis of Coronary Artery Disease. H. N. Segall.—p. 39.
*Interventricular Septal Defect (Roger's Disease) Occurring in Mother and Her 6 Month Fetus. A. W. Tucker Jr. and T. D. Kinney. —p. 54.
Effects of Amyl Nitrite on Downward T Wave of Electrocardiogram. E. Goldberger.—p. 60.
*Incidence of Embolic or Thrombotic Processes During Immediate Convalescence from Acute Myocardial Infarction. R. M. Nay and A. R. Barnes.—p. 65.
*Case of Infection with Brucella Suis, Causing Endocarditis and Nephritis; Death from Rupture of Mycotic Aneurysm. E. L. DeGowin, J. R. Carter and I. H. Borts.—p. 77.

Interventricular Septal Defect in Mother and Fetus.—Tucker and Kinney observed identical congenital cardiac lesions in a 20 year old mother and in her 6 months fetus. In each instance the lesion was a defect in the interventricular wall (Roger's disease) occurring at the base of the heart in the so-called undefended space. This lesion was diagnosed during life in the mother and proved by necropsy, while the lesion in the infant was demonstrated at necropsy. Heredity has often been mentioned as a possible factor, although few cases have been described as occurring in parent and offspring or in siblings. Further suggestive evidence that certain cases of congenital heart disease are due to inherent defects in the germ plasm is the not uncommon association of other congenital defects with congenital cardiac abnormalities. In Vierordt's series of 700 cases of congenital heart disease there were 80 cases with associated anomalies, while in Abbott's series of 1,000 cases 188 had associated anomalies elsewhere in the body. It is quite possible that the paucity of reports of congenital heart disease occurring in succeeding generations is due to the fact that relatively few persons suffering from congenital heart disease reach an age at which reproduction normally occurs.

Embolic and Thrombotic Processes During Convalescence from Myocardial Infarction.—Nay and Barnes studied 100 consecutive cases of coronary occlusion encountered at the Mayo Clinic. The criteria for diagnosis included an attack of severe substernal pain accompanied by sweating, pallor, fall of blood pressure and sometimes by collapse. In all instances positive electrocardiographic evidence was present. When death occurred during the period of observation and necropsy was performed, the clinical diagnosis was substantiated. Only patients who had entered one of the hospitals in Rochester, Minn., within a few days of the acute attack and had remained for a period of at least two weeks, unless death occurred prior to the conclusion of that period, were included. Complications of a thrombotic or embolic nature occurred in 37 cases. In 4 the complication caused death and in 8 cases the complications were contributing factors in the death. A second myocardial infarction occurred in 15 cases, pulmonary embolism occurred in 14 cases, cerebral thrombosis or embolism complicated 8, arterial occlusions were noted in 4, and thrombophlebitis complicated 7. Forty-six of the patients were known to have had normal blood pressure prior to the coronary occlusion and myocardial infarction. Ten of these had subsequent myocardial infarctions during the immediate convalescent period. Forty-two of the 100 patients had had hypertension prior to coronary occlusion, and 2 of these had subsequent myocardial infarctions during the immediate convalescent period. Eighty-seven per cent of the cases of second myocardial infarction and 87 per cent of the instances of cerebral vascular accidents occurred between the fourth and the twentieth day, and 86 per cent of the cases of thrombophlebitis occurred between the tenth and the sixteenth day, periods when the blood pressure of patients who have acute myocardial infarction has been demonstrated to be at lowest levels. Thirteen of the patients died: 2 of cerebral thrombosis, 1 of pulmonary embolism, 1 from a second myocardial infarction and 2 of congestive heart failure; in the other 7 the exact cause was not ascertained.

Infection with Brucella Suis.—DeGowin and his associates report studies on a farmer, aged 45, who had Brucella suis bacteremia. The infection lasted about two hundred days, during which endocarditis and nephritis developed. He recovered from uremia, only to succumb to rupture of a mycotic aneurysm of the left femoral artery. Sulfonamide therapy and the administration of convalescent serum failed to influence the infection. The pooled serum was prepared from the blood of donors who had recovered from Br. suis bacteremia. Anatomic studies after death revealed ulceration and vegetations on a previously normal mitral valve. The specific nature of the lesions was proved, during life, by the repeated isolation of Br. suis in pure culture from the blood stream, and, after death, by obtaining pure cultures of Br. suis from the vegetations from the endocardium, the walls of the mycotic aneurysm and other tissues. The blood contained specific agglutinins, but the skin did not react to brucellergin intradermally. As far as the authors are aware, this is the first reported case in which ulcerative endocarditis has been proved, beyond doubt, to be due to Br. suis. It is the second reported instance in which rupture of a mycotic aneurysm due to Br. suis has caused death.

American Journal of Surgery, New York

69:141-280 (Aug.) 1945

Plastic Surgery of Nasal Fractures. E. S. Lamont.—p. 144.
Bilateral Nummiform Fibromyomas of Nipples with Unilateral Fibromyoma and Papilloma Mamillae. J. J. Cunningham, S. E. Cohen and J. R. Cunningham.—p. 155.
Surgical Management of Substernal and Intrathoracic Goiter. A. W. Blain and A. DeMatteis.—p. 160.
Skin Grafting in Moribund Burned Patients. L. W. Eisenstodt. —p. 168.
Technic of Continuous Pentothal Anesthesia. N. B. Kornfield.—p. 177.
Inguinal Herniorrhaphy. T. L. Hyde.—p. 182.
*Treatment of Pulmonary Embolism. L. S. Pilcher.—p. 190.
Relative Efficacy of Penicillin, Tyrothricin, Streptothricin and Sulfathiazole on Hemolytic Streptococcus in Wounds of Rabbits. E. Neter, R. S. Hubbard and T. G. Lamberti.—p. 204.
Use and Abuse of Cesarean Section. E. G. Waters.—p. 208.
Fractures of Acetabulum. W. R. MacAusland and H. G. Lee.—p. 213.
Paget's Disease of Nipple. J. Kaufman.—p. 221.
Asymptomatic Pyuria in Young Men. F. A. Beneventi.—p. 224.
Ethyl Alcohol Intravenously as Postoperative Sedative. R. J. Behan. —p. 227.
Ambulant Method for Treatment of Pilonidal Disease: Preliminary Report. J. L. Mathesheimer.—p. 230.
Undescended Testicle. M. S. Rosenblatt.—p. 232.
Procedure for Preventing Wound Contamination During Appendectomy. B. J. Ficarra.—p. 234.
*Multiple Primary Malignancy. C. Goldman.—p. 265.

Treatment of Pulmonary Embolism.—Pilcher reports 5 cases in which accurate diagnosis of femoral vein thrombi was made largely through venography and in which satisfactory results were obtained by ligating and partially resecting the involved femoral vein. Three of the patients had suffered pulmonary emboli before the femoral vein ligation was performed. The diagnosis of femoral vein thrombosis, when it is not associated with obvious thrombophlebitis (and the cases not associated with obvious thrombophlebitis are the most dangerous from the point of view of pulmonary embolism), is often difficult to make because of the slight clinical symptoms. If the possibility is kept in mind the diagnosis can often be suspected

and the suspicion verified by venography. Treatment can then be instituted before a fatal pulmonary embolism occurs. The question of the relationship of edema of the leg to femoral vein thrombosis interested the author especially. He observed that severe edema was present only when there was definite thrombophlebitis in the peripheral veins and was slight or absent when there was a bland femoral thrombosis, even though the femoral vein was completely obstructed up to the saphenous junction. The contrast between the old and the new method of treatment is brought home forcibly when a patient who has had a near fatal pulmonary embolus is able to leave the hospital walking two weeks later. In addition to the removal of danger of further pulmonary emboli, the operation of ligation and partial resection of the femoral vein had a beneficial effect on associated thrombophlebitis, particularly in the prevention as well as the relief of associated peripheral edema.

Multiple Primary Carcinoma.—The subject of this report, a woman aged 60, had four primary carcinomas: (1) a medullary carcinoma of the breast, (2) a postirradiation carcinoma in the scar of the chest wall, with recurrence, (3) a transitional cell carcinoma of the cervix and (4) a papillary adenocarcinoma of the rectum. All lesions differed histologically and no lesion was a metastasis of another. A search of the literature by Goldman did not reveal other reports of four primary carcinomas in 1 patient.

Annals of Internal Medicine, Lancaster, Pa.

23:1-28 (July) 1945

Benign Paroxysmal Peritonitis. S. Siegal.—p. 1.
*Tissue Calcification and Renal Failure Produced by Massive Dose Vitamin D Therapy of Arthritis. T. S. Danowski, A. W. Winkler and J. P. Peters.—p. 22.
Syndrome of Psoas Myositis and Fibrositis: Its Manifestations and Its Significance in Differential Diagnosis of Lower Abdominal Pain. J. A. Greene.—p. 30.
Aids in Physical Diagnosis: Signs over Lower Left Lung Caused Chiefly by Cardiac Enlargement. E. M. Chapman and R. G. Anderson.—p. 35.
Diagnosis and Surgical Treatment of Ménière's Disease (Hydrops of Labyrinth). K. M. Day.—p. 41.
Effect of Doryl (Carbaminoylcholine) in Treatment of Peripheral Vascular Disease. G. Saland, R. Rosenthal, C. Klein and H. Zurrow. —p. 48.
Integration of Exact Sciences in Allergy Research. L. N. Gay. —p. 53.
Classification and Nomenclature of Leprosy, with Suggestions for Simplification of Both. H. L. Arnold Jr. and I. L. Tilden.—p. 65.
Current View of Rabies Problem. J. Casals.—p. 74.

Tissue Calcification and Renal Failure Following Vitamin D Therapy.—Danowski reports 2 cases of renal damage secondary to prolonged therapy with vitamin D. In 1 of these extensive calcification of soft tissues was demonstrable. The extensive destruction of bone evident in the wrists and right hip of 1 of the patients is an anomalous development in the natural course of atrophic arthritis. It suggests that the extensive intake of vitamin D together with a low intake of calcium and phosphorus produced disruption of the structure of the bone of the type reported in rats, with subsequent absorption of the injured bone. During the first five of the six years of therapy the patient did not drink milk nor did she receive supplementary calcium. In the last year she took one or two glasses of milk daily during a period of one month. No clear principle has been formulated for a rational use of vitamin D in arthritis. Its introduction followed the chance finding that patients receiving this vitamin for allergic conditions experienced a coincident improvement in arthritis. It has been shown in rats that vitamin D may produce either an increase or a decrease in the bone ash. Clinically, improvement in arthritis during administration of vitamin D is not correlated with any consistent alteration in the density of the skeleton or of exostoses. In serial roentgenograms the osteoporosis may increase, decrease or remain unchanged. It seems that the favorable effects of vitamin D reported in arthritis are unrelated to the metabolism of calcium and phosphorus. The authors conclude that the therapy of arthritis with vitamin D demands careful supervision. The patient should never be permitted to continue treatment on his own initiative. Frequent determinations of the serum calcium with prompt reduction of dosage if hypercalcemia develops are essential. Repeated examinations of the urine and blood pressure must be made if renal complications are to be avoided.

Archives of Internal Medicine, Chicago

76:1-62 (July) 1945

Healed Subacute Bacterial Endocarditis. P. Rosenblatt and L. Loewe. —p. 1.
Studies on Hypertension: IV. Bioassay of Vasoconstrictor Substances in Ultrafiltrates of Citrated Blood Plasma from Patients with Normal Blood Pressures, Patients with Essential Hypertension and Patients Made Hypertensive by Intravenous Injections of Angiotonin (Hypertensin). R. Gregory, P. L. Ewing, W. C. Levin and G. T. Ross. —p. 11.
*Optimum Dose of Sulfadiazine in Treatment of Pneumococcic Pneumonia. M. F. Collen and E. Phillips.—p. 22.
Reversal of Lingual Atrophic Changes with Nicotinamide Therapy. E. L. Sevringhaus and Emma D. Kyhos.—p. 31.
Arteriosclerotic Peripheral Vascular Disease in Diabetes. J. Herzstein and L. A. Weinroth.—p. 34.
Effect of Intravenously Administered Solution of Acacia on Animals. R. E. Smalley, M. W. Binger, J. L. Bollman and M. H. Power. —p. 39.
Habitus of Patients with Active Sickle Cell Anemia of Long Duration. T. Windsor and G. E. Burch.—p. 47.
Circulation in Acute Myocardial Infarction. A. Selzer.—p. 54.

Sulfadiazine in Pneumococcic Pneumonia.—Collen and Phillips determined the optimal dose of sulfadiazine through observations on 1,465 patients with pneumococcic pneumonia treated at the Permanente Foundation Hospital in Oakland, Calif. In the first half of this period 618 consecutive patients were treated with the usual doses of sulfadiazine, namely 5 Gm. initially and 2 Gm. every six hours thereafter, an average blood level of 8 to 10 mg. per hundred cubic centimeters being maintained. In the second half of this period 748 consecutive patients with pneumococcic pneumonia were treated with double doses of sulfadiazine. The majority of patients in the group receiving the double dose received 5 Gm. of sodium sulfadiazine in 500 cc. of sixth molar sodium lactate solution (p_H 7.0 to 7.2) intravenously and 5 Gm. of sulfadiazine orally (total 10 Gm.) initially followed by 4 Gm. of sulfadiazine orally every six hours thereafter, an average blood concentration of sulfadiazine of 12 to 20 mg. being maintained. The two groups of patients had pneumococcic pneumonia of comparable severity. Adjuvant therapy, including the use of specific pneumococcus serum, was similar in the two groups. The treatment of patients with pneumococcic pneumonia with double doses of sulfadiazine resulted in a decrease in the gross mortality from 10.7 to 6.2 per cent, a decrease in the incidence of sterile pleural effusions from 5.2 to 2.7 per cent and a decrease in the average number of days in the hospital required for recovery (66 per cent required less than seven days, as compared to 45 per cent). There was no greater incidence of drug toxicity in patients treated with double doses of sulfadiazine than in those treated with usual doses. The authors conclude that for severely ill adult patients with pneumococcic pneumonia sufficiently large doses of sulfadiazine should be administered to maintain blood concentrations of at least 15 mg., with the optimal blood levels maintained preferably at about 20 mg. of sulfadiazine per hundred cubic centimeters.

Archives of Pathology, Chicago

40:1-80 (July) 1945

*Mixed Tumors of Salivary Glands. C. A. Hellwig.—p. 1.
Hematic and Anatomic Changes in Dogs After Repeated Intravenous Injections of Large Amounts of Inulin Solution. W. C. Hueper. —p. 11.
The Brain in Leukemia: Clinicopathologic Study of 20 Cases, with Review of Literature. F. Leidler and W. O. Russell.—p. 14.
Comparative Efficacy of Pancreatin and Pepsin in Experimental Production of Intestinal Ulcers. R. L. Driver.—p. 34.
Experimental Nephropathies: III. Calcification and Phosphatase in Kidneys of Dogs Poisoned with Mercury Bichloride, Potassium Dichromate and Uranyl Nitrate. O. E. Hepler and J. P. Simonds. —p. 37.
Osteoid Sarcoma of Breast: Complication of Fibroadenoma. A. Rottino and C. P. Howley.—p. 44.
Solitary Giant Follicular Lymphoma of Vermiform Appendix. R. P. Morehead and W. E. Woodruff.—p. 51.
Influence of Dietary Deficiencies and Various Poisons on Histochemical Distribution of Phosphatase in Liver. M. Wachstein. —p. 57.
Carcinoma Derived from Adult Seminiferous Epithelium: Review of Literature and Report of Case. B. E. Stofer.—p. 68.

Mixed Tumors of Salivary Glands.—Hellwig discusses observations on 82 primary tumors of salivary glands that have been studied during the last twenty years in the laboratory of the St. Francis Hospital, Wichita, Kan., among 4,352 cancers. The average age of the patients with mixed tumors was 38.4

years. More women were operated on for mixed tumors and more men for true cancers of the salivary glands. Sixty-eight tumors were located in the parotid glands, 12 in the submaxillary glands, 3 in the palate and none in the sublingual glands. Histologically, 51 of the 82 tumors were of mixed tumor type, 16 were of the adenomatous type, 8 presented combinations of these two types and 7 were true cancers. The salient feature of mixed tumors is the transformation of epithelial cells into myxochondroid tissue. The origin of tumor cells which can appear as of epithelial and again as of mesenchymal nature is not satisfactorily explained by the three current theories of the histogenesis of the mixed tumors of the salivary glands. From embryologic, histologic and topographic studies it is concluded that mixed tumors of the salivary glands are derived from misplaced elements of the notochord. This view would explain not only the complex structure of mixed tumors but also the striking predilection of these tumors for the parotid glands.

Bull. of the U. S. Army Med. Dept., Washington, D. C.

4:123-244 (Aug.) 1945

Use of Small Airplanes for Medical Evacuation on Luzon. M. J. Musser Jr. and E. C. Townsend.—p. 191.
*Symptomatology of Early Schistosomiasis Japonica. H. M. Thomas Jr. and D. P. Gage.—p. 197.
Cross Connections at Army Installations. H. H. Gerstein.—p. 203.
Drugs in Treatment of Periodontal Disease. I. Buchin.—p. 209.
Recognition of Leptospiral Infections. W. W. Stiles.—p. 214.
Pulsating Hematoma: Report of Cases. J. D. Martin Jr.—p. 219.
Importance of Careful Selection of Soldiers for Ligation of Varicose Veins. W. L. Butsch and J. C. Harberson.—p. 226.
Filariasis in the White Man. H. Neumann.—p. 230.
Sudden Death in Patient Supposed to Have Myocarditis Following Scrub Typhus. J. E. Benjamin, R. R. Porter and R. H. Dreisbach.—p. 235.

Symptomatology of Early Schistosomiasis Japonica.—Thomas and Gage report observations on 41 patients infected with schistosomiasis following the invasion of Leyte Island. All were studied within three months of their first infection. In 4 of these cases a history of burning and itching immediately after exposure was obtained. Symptoms which appeared between the third and ninth weeks were chills, fever, sweats, headache, backache, nonproductive cough, abdominal discomfort and profound anorexia. Urticaria accompanied these symptoms in one fourth of the cases and diarrhea in one fifth. The temperature was usually low in the morning and higher in the afternoon, reaching from 99 to 105 F. There was leukocytosis which rose from day to day, reaching a count as high as 50,000. Eosinophilia was present, at first to the extent of 15 to 20 per cent, later rising rapidly, reaching 50, 70 and, in a few cases, 90 per cent. The total number of eosinophils was often as high as 20,000. In 1 case 86 per cent of 54,400 white blood cells or 44,700 eosinophils were recorded. Patients varied from being practically asymptomatic to being extremely ill. Those with high fever sweat profusely, especially at night. They found it difficult to take nourishment and complained of severe headache, abdominal distention and cramps, and tenderness over the liver. Cough was troublesome and was often worse at night. The authors describe 2 cases which illustrate the course of schistosomiasis. Chemotherapy consisted of antimony and potassium tartrate in some instances and fuadin in others. No untoward reactions to fuadin were noticed. The commonest side effect of the antimony and potassium tartrate was nausea. Symptoms were promptly relieved in most cases, and eggs disappeared from the stools at least temporarily in many instances.

Journal of Experimental Medicine, New York

82:77-156 (Aug.) 1945

Plasma Protein Production Influenced by Amino Acid Mixtures and Lack of Essential Amino Acids: Deficiency State Related to Unknown Factors. S. C. Madden, F. W. Anderson, J. C. Donovan and G. H. Whipple.—p. 77.
Bacteriostatic Effect of Human Sera on Group A Streptococci: I. Type-Specific Antibodies in Sera of Patients Convalescing from Group A Streptococcal Pharyngitis. S. Rothbard.—p. 93.
Id.: II. Comparative Bacteriostatic Effect of Normal Whole Blood from Different Animal Species in Presence of Human Convalescent Sera.—p. 107.
Id.: III. Interference with Bacteriostatic Activity by Blockage of Leukocytes. S. Rothbard.—p. 119.
Chemical Alteration of Bacterial Surface, with Special Reference to Agglutination of B. Proteus OX-19. S. S. Cohen.—p. 133.
Investigations on Occurrence of Rh Substances in Amniotic Fluid. E. Witebsky and J. F. Mohn.—p. 143.

Military Surgeon, Washington, D. C.

97:85-176 (Aug.) 1945

Anti-Malaria Measure on Indo-Burmese Border from 1942 to 1944. B. M. K. Afridi and J. H. Arthur.—p. 85.
Atheromatosis to Be Distinguished from Arteriosclerosis. J. B. Wolffe.—p. 92.
Troop Casualties Aboard an Attack Transport. E. S. Groseclose.—p. 100.
Phobias in Pilots. D. B. Davis.—p. 105.
Chemotherapeutic Adjuncts in Treatment of Necrotic Gingivitis: Review. A. H. Horowitz and S. L. Horowitz.—p. 112.
Metacarpal Neck Fractures. J. R. Vasko.—p. 121.
*Conservative Treatment of Human Bite Infections: Report of 2 Cases. M. G. Henry.—p. 122.
Myotonia Congenita. E. J. Denenholz and M. Blum.—p. 126.
Method to Shorten Hospitalization of Patients with Pilonidal Cysts. H. E. Kennard.—p. 132.
Cardiac Wound Caused by Spine of Stingray (Suborder Masticura): Report of Case.—p. 135.
Plastic and Reconstructive Surgery of Hand. B. Cannon and W. C. Graham.—p. 137.
Psychiatric Consultations in the Army. C. N. Sarlin.—p. 139.
Salmonella Outbreak Involving Three Types of Genus. C. C. Randall and L. M. Marks.—p. 144.
Failure of Oral Quinine and Atabrine Therapy in Patient with South Sea Malaria. W. L. Noe Jr. and G. Cheney.—p. 146.
Simple Apparatus for Continuous Intravenous Anesthesia. P. A. Waters and J. L. Diamond.—p. 150.
Mycotic Infections of Feet Among Soldiers. F. A. Dolce.—p. 152.

Treatment of Human Bite Infections.—Henry describes 2 cases of human bite infection, both involving the right hand. All such wounds should be immediately cleansed well with soap and water, followed by gentle débridement. Dark field examinations and ten day anaerobic cultures are diagnostic aids. Tetanus antitoxin or a booster shot should be given. The wound should be irrigated with hydrogen peroxide and diluted solution of sodium hypochlorite. These wounds should never be sutured or repaired, but they should be left wide open and sprinkled with sulfonamide crystals. Hot magnesium sulfate or boric acid soaks should be applied daily for one week. The Wassermann and Kahn tests should be made and repeated one month from the time of the bite. Amputation should be avoided in the presence of an acute infection. Treatment should be conservative, and nature should be allowed to wall off the process. Bone involvement must be ascertained by x-ray at the time of injury and again later. Because rest aids the healing process, splinting is essential. Though penicillin has slight if any effect on certain mixed infections, a ten day treatment with penicillin would be indicated, 100,000 units being administered each day.

New Jersey Medical Society Journal, Trenton

42:205-250 (July) 1945

Penicillin Treatment for Syphilis and Gonorrhea. State of New Jersey Department of Health.—p. 227.
Nutrition in Everyday Practice. S. W. Kalb.—p. 227.

42:251-282 (Aug.) 1945

Chest X-Ray in Wartime Industrial Examinations. W. L. Bonnet.—p. 253.
Management of Recurrent Vesiculopustular Eruptions of Hands and Feet. C. C. Carpenter.—p. 262.
Neuropsychiatric Screening of Selective Service Registrants in New Jersey. E. Frankel.—p. 268.
Nutrition in Everyday Practice. S. W. Kalb.—p. 274.

Radiology, Syracuse, N. Y.

45:107-212 (Aug.) 1945

Roentgen Diagnosis of Pulmonary Infarcts. G. R. Krause.—p. 107.
Roentgen Appearance of Lobar and Segmental Collapse of Lung: IV. Collapse of Lower Lobes. L. L. Robbins and C. H. Hale.—p. 120.
Value of Gastric Pneumography in Roentgen Diagnosis. S. F. Thomas.—p. 128.
Rapid Development of Bone Changes in Patient with Syringomyelia as Observed Roentgenologically. E. P. Pendergrass, G. D. Gammon and J. H. Powell.—p. 138.
Unusual Pleural Effusions. S. Katz and H. R. Reed.—p. 147.
Radon Ointment Treatment of Irradiation Ulcers. R. E. Fricke and M. M. D. Williams.—p. 156.
Capsular Osteoma of Knee Joint: Report of 4 Cases. F. G. Kautz.—p. 162.
Filing and Cross Indexing of Radiation Therapy Records. I. Lampe.—p. 168.
Cross Indexing of Roentgen Diagnostic Records: Revision of Hodges and Lampe Code. B. R. Van Zwaluwenburg.—p. 176.
Objectives of Radiologic Aspects of Tuberculosis Control Program. H. E. Hilleboe and R. H. Morgan.—p. 185.
Note on Cholecystography with Priodax: Dosage and Gastrointestinal Effects. H. Quastler.—p. 190.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

26:67-136 (April) 1945

*Production of Severe Hepatic Injury in Rats by Prolonged Feeding of Maize-Meal Porridge (Mealiepap) and Sour Milk. J. Gillman, T. Gillman, J. Mendelstam and C. Gilbert.—p. 67.
Glucose Content of Tissue Fluid in Hypoglycemic Coma. W. Mayer-Gross and J. W. Walker.—p. 81.
Properties and Pathogenicity of Virus Derived from Sheep Dermatitis. F. R. Selbie.—p. 89.
Some Observations on Penicillinase. H. Proom.—p. 98.
Treatment with Antitoxin of Experimental Gas Gangrene Produced in Guinea Pigs by (*a*) Clostridium Welchi, (*b*) Clostridium Oedematiens and (*c*) Clostridium Septicum. D. G. Evans.—p. 104.
*Study of Hemopoiesis in Pernicious Anemia Bone Marrow. J. Japa.—p. 111.
Antibacterial Effects of Analogues of Vitamin K. P. Atkins and J. L. Ward.—p. 120.
Hyaluronidase Production by Staphylococci. H. Schwabacher, A. C. Cunliffe, R. E. O. Williams and G. J. Harper.—p. 124.
Influence of Shaking on In Vitro Production of Soluble Bacterial Toxins. E. S. Duthie and J. A. H. Wylie.—p. 130.

Hepatic Injury in Rats from Corn Meal Porridge and Sour Milk.—Gillman and his associates fed rats weighing 50 Gm. on a diet of corn meal porridge and sour milk. At the end of fifteen months they had severe liver damage manifesting itself as a diffuse fatty liver, cirrhosis, lobar absorption or diffuse lobar enlargement. One or more of these pathologic processes may be present in the same liver. Biopsies of the livers of these rats, performed at frequent intervals, revealed that fat appears in the liver cells at the end of fourteen days and increases steadily until, after two hundred and fifty days, the liver is diffusely enlarged as the result of the accumulation of single large fat globules in almost all the liver cells. At this stage the sinusoids are for the most part closed, and the liver is relatively avascular. Thereafter secondary changes may occur leading to the absorption or diffuse enlargement of entire lobes or to nodular cirrhosis. It appears that the hepatic parenchyma and the interstitial tissue react independently of each other to the dietary injury. Cirrhosis is not a necessary sequel to hepatocellular damage, and whole lobes of the liver may be absorbed without stimulation of the connective tissue elements. In the development of the liver lesions there are two distinct phases. The first manifests itself as a diffuse accumulation of fat in the liver cells and the second as a vascular change, which may culminate in complete lobar absorption or may be associated predominantly with a fibrous tissue reaction with or without the regeneration of liver cells. A long standing fatty liver does not necessarily culminate in cirrhosis or lobar absorption. The absorption of an entire lobe implies a complete suppression of the reparative powers of the liver, together with the inhibition of some factor essential for the survival of the parenchyma and interstitium. Animals weighing over 100 Gm. are resistant to the effects of this diet as compared with younger animals (50 Gm.). On this diet growth is apparently an essential factor for the development of liver damage.

Hemopoiesis in Pernicious Anemia.—Japa studied hemopoiesis in a woman aged 65 with typical pernicious anemia. Three specimens of sternal marrow were obtained by the usual technic—one before treatment, the second at the peak of the reticulocyte response on the sixth day after the parenteral administration of the liver extract and the third four weeks later, when considerable improvement in the peripheral blood count had taken place. The pathologic changes observed affect all three cell systems of the bone marrow and are in each of them of the same essential character. The analysis of the process of mitosis shows that the essential abnormality of hemopoiesis in pernicious anemia is the inhibition of the cell capacity for division, resulting in the prolonged duration of mitosis, its decreased frequency and earler cessation, with consequent differentiation at an earlier genealogic stage. These changes seem to be closely connected with the lack of the proper development of the nucleoli and possibly some pathologic changes in the nucleic acids metabolism induced by the insufficient supply of the hemopoietic principle.

Journal of Physiology, Cambridge

104:1-104 (June) 1945

Diurnal and Sampling Variations in Determination of Hemoglobin. R. H. Mole.—p. 1.
Determination of Hemoglobin and Methemoglobin. S. Kallner.—p. 6.
Formation of Acetylcholine in Cell Free Extracts from Brain. W. Feldberg and T. Mann.—p. 8.
Effect of Adrenalectomy on Contractile Power of Skeletal Muscle. A. Schweitzer.—p. 21.
Regional Distribution of Sweating. J. S. Weiner.—p. 32.
*Digestibility of Phytate P of Oatmeal in Adult Man. E. W. H. Cruickshank, J. Duckworth, H. W. Kosterlitz and G. M. Warnock.—p. 41.
Testing Diphenylethylamine Compounds for Analgesic Action. E. C. Dodds, W. Lawson, S. A. Simpson and P. C. Williams.—p. 47.
Behavior of T. 1824 (Evans's Blue) in Circulating Blood and Modified Method for Estimation of Plasma Volume. E. W. H. Cruickshank and I. C. Whitfield.—p. 52.
Effect of Chronic Administration of Adrenalin on Suprarenal Cortex and Comparison of this Effect with that of Hexestrol. M. Vogt.—p. 60.
Influence of Duration of Sensitization on Anaphylaxis in Guinea Pig. L. B. Winter.—p. 71.
Electric Response of Human Eye. E. D. Adrian.—p. 84.

Digestibility of Phytate P of Oatmeal.—Cruickshank and his associates report observations on 4 adult subjects consuming a diet rich in oatmeal. They found that the phytate P of oatmeal was almost completely digested by the 4 adult subjects when the calcium intake approached requirement, and the P of the hydrolyzed phytic acid was absorbed from the intestine. Addition of calcium to the diet decreased the digestibility of phytate P if the supplementary calcium was taken together with the oatmeal and not if it was taken separately.

Lancet, London

2:1-32 (July 7) 1945

Organization of Airborne Surgical Center. J. C. Golighter and G. C. Wells.—p. 1.
Air Arthrography in Diagnosis of Torn Semilunar Cartilage. E. G. Herzog.—p. 5.
*Late Bone Lesions in Caisson Disease: 3 Cases in Submarine Personnel. C. C. M. James.—p. 6.
Fatigue Fracture of Tibia: 3 Cases at a Naval Training Establishment. T. P. Mann.—p. 8.
Fatigue Fracture of Femur and Tibia. H. R. I. Wolfe and J. M. Robertson.—p. 11.
Stress Fracture of Femoral Neck. J. A. W. Bingham.—p. 13.
Vitamin C Content of Milk as Consumed. E. H. Mawson and S. K. Kon.—p. 14.
*Positive Influence of Water Supply on Health. Margaret M. Murray and D. C. Wilson.—p. 23.

Late Bone Lesions in Caisson Disease.—In 1931 a submarine sank in 120 feet of water. Five of the crew escaped and survived, using the Davis apparatus. They all suffered in varying degree from the "bends" immediately or shortly after arriving at the surface. Before escaping they had to wait while the compartment was filled with water to equalize the pressures outside and inside the vessel. When these pressures were equal, a hatch could be opened outward to allow the men to rise to the surface. Two men escaped after two and one-half hours under this increasing pressure and the rest after three hours. No recompression treatment was performed. When examined twelve years after the accident 3 of the 5 survivors showed bone lesions; the other 2 survivors could not be traced. In 1 of the 3 the bone lesions were much more severe, probably because this man made strenuous efforts to open a stopcock. In radiologic examination all 3 men showed small rounded areas of rarefaction surrounded by a thin shell of hypercalcification in the end of the long bones, confirming the pathology of infarction followed by aseptic necrosis and incomplete repair. In the severe case the heads of both femurs had partially collapsed, resulting in osteoarthritis deformans. The exact cause of infarction is not known.

Influence of Water Supply on Health.—Recent research has emphasized the health aspects of three minerals found in water: calcium, iodine and fluorine. Lack of calcium may interfere with calcification of bones and teeth; lack of iodine may lead to enlargement of the thyroid gland; lack of fluorine may favor the development of dental caries. Murray and Wilson point out that in Britain the Water Act, which received the royal assent on June 15, 1945, will impose on the minister of health for the first time the duty of promoting the provision of a water supply adequate for all reasonable needs of house-

holders. To meet the "reasonable needs of householders for water," as is mentioned in the Water Act, the health and environmental aspects of a water supply should be taken into account. By comparing the water supply conditions in two villages, the authors show that water schemes cannot be planned efficiently on a village basis and that in some districts it may be necessary to employ alternative supplies calculated to give a water of desirable mineral content, or even a mixture from several sources, in order to meet both health and nutritional requirements. Such adjustments in composition will not ensure an adequate supply in every household, because there may be environmental reasons which prevent the proper utilization of the water supplied.

Practitioner, London

155:65-128 (Aug.) 1945

Rest in Disabilities of Locomotor System. H. Platt.—p. 65.
Congenital Dislocation of Hip. G. Perkins.—p. 70.
Malunion of Fractures. R. Broomhead.—p. 78.
Sciatica as Orthopedic Problem. K. H. Pridie.—p. 84.
Osteoarthritis as Orthopedic Problem. A. M. Hendry.—p. 89.
Carcinoma of Axillary Tail of Breast. D. C. L. Fitzwilliams.—p. 95.
Bites and Stings. C. G. Learoyd.—p. 102.

South African Medical Journal, Cape Town

19:161-180 (May 26) 1945

*Serologic Diagnosis of Typhus Fever in South Africa. B. Wolstenholme and J. Gear.—p. 162.
*Survival of Transfused Erythrocytes of Stored Blood. A. Altmann and E. F. Watson.—p. 167.
Problems and Treatment of Immersion Blast in Royal Navy. E. P. P. Williams.—p. 169.
Intensive Treatment of Schistosomiasis with Antimony. W. Alves. —p. 171.

Serologic Diagnosis of Typhus.—Wolstenholme and Gear evaluate the serologic tests for the laboratory diagnosis of typhus. They regard the Weil-Felix test as the most reliable and describe the agglutination of the various strains of Proteus used in epidemic typhus, murine typhus and tick bite fever. This test does not distinguish between epidemic and murine typhus, and sometimes either of these forms of typhus from tick bite fever. "Bedside" or "field" tests for the diagnosis of typhus are described, and it is noted that under South African conditions the most valuable of these is a modification of the method of Castaneda and Silva. The results have been found to agree very closely with those given by the standard Weil-Felix test. This test also does not differentiate between the various forms of typhus found in South Africa. Such differentiation is possible in most cases by means of the rickettsial complement fixation tests. The rickettsial complement fixation test is a reliable serologic test for the diagnosis of typhus and of tick bite fever. In most cases it is possible by means of this test to distinguish between epidemic typhus and murine typhus, and between these two forms of typhus and the variety of tick bite fever occurring in South Africa. The rickettsial complement fixation is thus a valuable additional serologic test for the diagnosis of typhus.

Survival of Transfused Erythrocytes of Stored Blood.—Altmann and Watson point out that sodium citrate alone as an anticoagulant is not wholly satisfactory in that the survival time of the transfused erythrocytes is shortened. The addition of dextrose prolongs the useful storage period in that survival is satisfactory after storage from fourteen to twenty days, but dextrose cannot be autoclaved with sodium citrate, as it caramelizes at high temperatures in an alkaline medium. A sodium citrate-citric acid-dextrose mixture of p_H 4.8 to 5.0 does not show caramelization of the dextrose after autoclaving. Blood stored in this mixture remains suitable for transfusion, as far as the in vivo survival of the transfused red cells is concerned, for a period up to twenty-one days. Blood stored for periods up to fifteen days in sodium citrate-citric acid-glucose solution gives in vivo survival of the transfused erythrocytes identical to fresh blood. Blood stored for twenty-one days still remains satisfactory, and even blood stored for twenty-eight days can be used with benefit to the patient. Blood should not be stored for more than twenty-one days as a routine. Except for the hemorrhagic states and other clinical conditions which require fresh blood, blood stored by this method can be used in all cases in which transfusion is indicated.

Presse Médicale, Paris

53:161-172 (March 31) 1945

*Carotid Sinus and Retinal Circulation. Riser, Planques, Couadau and Seigneuric.—p. 161.
*Digestive Allergy: Sensitization to a Decomposition Product of Food Protein. P. Blamoutier.—p. 162.
Disregarded Cause of Undulant Fever. P. Lesbre.—p. 162.

Carotid Sinus and Retinal Circulation.—Riser and his associates report observations on 50 subjects in whom they determined simultaneously the retinal arterial tension and the general arterial tension, while performing various manipulations on the carotid sinus, such as digital compression of the sinus region, inhibition of the sinus by procaine hydrochloride and compression of the carotid artery below the sinus. They stress that the variations provoked in the general and the retinal arterial tensions by excitation of the carotid sinus are always synchronous and of the same amplitude. There never appeared a direct action of the sinus on the retinal circulation that could be separated from the action on the general circulation.

Sensitization to Decomposition Product of Food Protein.—Blamoutier points out that, when sensitization takes place by the respiratory route, the cutaneous reactions with the offending substance are nearly always positive. This is not the case in anaphylaxis of digestive origin. A certain protein, such as that of eggs, meat or milk, may elicit an urticarial crisis every time it is ingested and the skin reaction with the substance may nevertheless remain constantly negative. The author together with Pasteur Vallery-Radot had the idea that such subjects are sensitized not to the ingested protein but to a decomposition product of this protein which develops in the course of digestion. He describes studies on a patient aged 34 who for about ten years had had attacks of generalized urticaria with Quincke's edema of the face every time he ate lamb or mutton. The attack appeared five to six hours after the meat had been ingested. All skin tests with lamb or mutton were negative. Even samples incubated with gastric or with duodenal juice produced negative results. However, when specimens of the meat were incubated with both gastric and duodenal juice a positive skin reaction was finally obtained. A Prausnitz-Küstner test with this liquid was likewise positive. The positive outcome of these two tests convinced the author that the patient was sensitized to a product of the digestion of the meat rather than to the meat itself.

Giornale di Medicina, Palermo

2:342-398 (April-May) 1945. **Partial Index**

*Nitrogen Determination by the Kjeldahl Method. S. Sorce.—p. 353.
Epinephrine Therapy (Ascoli's) in Pernicious Malaria. F. Scuderi. —p. 362.

Kjeldahl Method for Determination of Nitrogen.—Sorce made simultaneous determinations of the amount of nitrogen in the blood and in the urine of 10 normal adults and 10 diabetic patients by the wet (Kjeldahl) and the dry (Dumas) methods. In both groups the nitrogen values in the urine and in the blood were higher when the dry method was used. In normal persons the differences with the dry method varied between 2.06 and 5.67 per hundred cubic centimeters of urine and between 4.16 and 12.50 per hundred cubic centimeters of blood. In diabetic patients with hyperglycemia and glycosuria and before administration of any therapy the differences of excess were of 2.70 per hundred cubic centimeters of urine and of 37.77 per hundred cubic centimeters of blood. The nitrogen values in the urine and in the blood returned to normal as glycemia was lowered and glycosuria disappeared on correct insulin and diet therapy. Before treatment was begun there was no relation between the degree of hyperglycemia and glycosuria and the nitrogen values in the urine and in the blood. The author points out that in diabetes, especially in severe forms of the disease, nitrogen bodies, which cannot be determined by the Kjeldahl method, increase in the blood up to figures over 30 per cent. The increase is due to metabolic disorders of nitrogen, which are severe in the grave forms of the disease. An expression of the disorder is manifested by azoturia and aminoaciduria, which in many diabetic patients reaches figures twice those of normal urinary excretion of nitrogen.

Book Notices

The History of Surgical Anesthesia. By Thomas E. Keys. With an Introductory Essay by Chauncey D. Leake, and a concluding chapter The Future of Anaesthesia by Noel A. Gillespie. Cloth. Price, $6. Pp. 191, with 43 illustrations. New York: Schuman's, 1945.

The author of this book has become a real authority on the subject of the history of surgical anesthesia. He has been trained as a librarian, and he has learned to make proper evaluation of printed matter. He has written on the subject of the history of anesthesia repeatedly over a period of years, and his work has received the approbation of those who are keenly interested in the subject of medical history. He is therefore most competent to prepare such a book as this one.

The form of the book is one that lends itself to easy understanding because the volume is not too large, it is well printed on good paper and it is thoroughly illustrated and annotated. The purpose of the author was to discuss the subject not from the view of controversy on the point of who should have priority for a given thing but simply to present the facts as they appear in the existing literature. The subject has been covered in a brief but general way so that as many things as possible might be touched on without going into great detail on any one of them.

Presentation of the subject is most satisfactory. The author has made clear in his preface what he planned to do and some of the story of why he did it. He was most fortunate to have obtained an introductory essay by Dr. Chauncey D. Leake, dean of the Medical School of the University of Texas. It indicates very well Dr. Leake's long and keen interest in the subject of anesthesia. The story of anesthesia is then printed and illustrated in pages 3 to 92 and is followed by a bibliography running from pages 93 to 102 that indicates the original sources of material. In the second section, pages 103 to 118, is a chronology of events relating to anesthesiology and allied subjects which is similar to the one that the author prepared for "Clinical Anesthesia." From pages 119 to 125 is the bibliography relating to the chronology table. The third section is presented from pages 126 to 169 and includes a comprehensive bibliography. It could be well called "suggested reading" for those who would like to know in detail the history and progress of the development of anesthesiology. "The Future of Anaesthesia" has been prepared by Noel A. Gillespie and runs from pages 170 to 175. It presents his idea of that subject. In an appendix Dr. John F. Fulton has allowed the use of the material at his disposal concerning Morton and some early literature on ether. The index is easy to use and extends from pages 183 to 191.

It would appear that all of the statements in this book are defendable and most of them are documented. There is no doubt that the material is accurate.

There can be no doubt that this is the best and most thorough presentation of the history of surgical anesthesia that has yet been written.

The Bacterial Cell in Its Relation to Problems of Virulence, Immunity and Chemotherapy. By René J. Dubos, George Fabyan Professor of Comparative Pathology and Professor of Tropical Medicine, Schools of Medicine and Public Health, Harvard University, Boston, Mass. With an Addendum by C. F. Robinow. Harvard University Monograph in Medicine and Public Health No. 6. Cloth. Price, $5. Pp. 460, with 13 illustrations. Cambridge, Mass.: Harvard University Press; London: Oxford University Press, 1945.

Knowledge of cellular immunology has lagged in development behind cellular pathology. Summarizing and integrating presentations in book form of what is known of cellular immunology have been scarce and inadequate. This monograph is a timely and much needed contribution. Dubos has succeeded admirably in blending in organic fashion results of widely scattered biochemical, physical and immunologic studies. An introductory chapter deals with problems, materials and methods. The subjects of cytology of bacteria and their physicochemical and staining properties, cellular structure, variability, virulence, immunization against bacterial infection, and bacteriostatic and bactericidal agents are treated in separate chapters. The concluding chapter, on trends and perspectives, is stimulating in its philosophical vein. Wisely selected quotations at the beginning of each chapter introduce a broad contemplative element and add much to the readability. There is an appendix by Robinow on the nuclear apparatus and cell structure of rod-shaped bacteria. The presentation is lucid, complete and up to date. There are seventy-one pages of bibliography. In the German titles the nouns have not been capitalized. This book is warmly recommended to all interested in bacteriology and immunology.

The New-Born Infant: A Manual of Obstetrical Pediatrics. By Emerson L. Stone, M.D., Associate Clinical Professor of Obstetrics and Gynecology, School of Medicine, Yale University, New Haven, Conn. Third edition. Cloth. Price, $3.25. Pp. 314. Philadelphia: Lea & Febiger, 1945.

The book, as the author states, has two aims: to correlate and arrange in orderly fashion a mass of data that is otherwise scattered through a vast medical literature and to emphasize at every possible opportunity the obstetrician's point of view and responsibility to sharpen and extend his interest in this important branch of his work. This it does in an unusually interesting manner. The book covers every phase of the newborn period in a clear, simple and accurate manner, discussing methods of prevention, diagnosis and treatment of the many problems of this period. The work is a credit to the obstetrician and stimulates interest in the baby at a time when quick, intelligent care is so important and so frequently neglected. Every obstetrician, general practitioner and pediatrician should have the book.

Proceedings of the Institute on Readjusting with the Returning Servicemen, Held March 8-9, 1945, in The Knickerbocker Hotel, Chicago, Illinois Under the Auspices of the Illinois Society for Mental Hygiene. Paper. Price, $1.25. Pp. 156. Chicago: The Society, 1945.

This book presents the proceedings of a two day institute held in Chicago in March under the auspices of the Illinois Society for Mental Hygiene. It includes the round table discussions and papers read at the conference. The material essentially relates to the psychologic and psychiatric aspects of problems of readjustment to civilian life, with emphasis on postwar educational and vocational needs and the personal relationships involved in family life. An optimistic note is sounded by some of the speakers in recognizing the benefit of military training and experiences in strengthening many men for orientation of attitudes essential for civilian adjustment. There is also stressed the need for friendliness and expressions of genuine interest to the returning veteran from all those at home with whom he will have dealings. This is a timely book, representative of the thinking and plans of a group of people closely concerned with the readjustment of the veteran.

Secretaria de salubridad y asistencia, memoria 1943-1944, basada en el informe de labores. Presentado al H. ejecutivo de la Unión. Por el Dr. Gustavo Baz, secretario del ramo. Paper. Pp. 420, with illustrations. Mexico, D. F., [n. d.].

This book is based on the report of Dr. Baz to the executive government of Mexico. Dr. Baz is the secretary of the Mexican Secretariat of Sanitation and Assistance, the national department which was created from the fusion of the Secretariat of Public Assistance and the Department of Public Health. The report is concerned with the work on public health, sanitation and public assistance as carried on by the department from Sept. 1, 1943, when it began to function, up to Aug. 31, 1944. The author in the introduction outlines the purpose of the work of the actual government and of his department, which is to care for the Mexican population in all the fields of health, sanitation and education. The book contains several chapters showing (1) the development of hospitals through the country, (2) the better training of technicians in these fields and the international exchange of technicians and (3) a report on work carried on in sanitation, epidemiology, hygiene, nutrition, care of infants and children, vaccination, prevention of tuberculosis and prevention and therapy of venereal diseases and tropical diseases. The functions and work carried on by the various departments of the secretariat in the various states of Mexico are described in detail. The hospitals, policlinics, crèches and many centers for giving health care to the people are excellent in all respects, as shown by the pictures. The book vividly shows the importance given to public health and public assistance in Mexico by its government.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ACUTE NEPHRITIS IN CHILD

To the Editor:—**A 7 year old girl came down with acute nephritis March 23, 1945 with a nonprotein nitrogen count of over 100, and the urine loaded with red blood cells. Concomitant acute mastoiditis cleared up with penicillin. The urinary findings have improved steadily, so that at present only a plus minus albumin remains. Urine studies are done weekly. Should a change of climate from Pittsburgh be considered for the coming winter? Please name a few general localities in the continental United States where the climate would be of value in prophylaxis against development of chronic nephritis by keeping upper respiratory infections to a minimum.**

Captain, M. C., A. U. S.

ANSWER.—It is to be hoped that the child received sufficient penicillin to destroy the infecting organisms completely, for there exists a definite hazard in the possibility of developing resistant strains which then would not yield to penicillin therapy in the future. It is well known that upper respiratory infections are much less frequent in the Southern states and particularly in the Arizona, New Mexico, Colorado area. Chilling, smoke and dusts are predisposing factors to acute respiratory infections; avoidance of these is desirable. Florida, the Gulf Coast or southern Texas is less desirable for a patient such as the one described because of the greater heat and the high atmospheric humidity, which make for excessive perspiration and therefore handicap the repair of the kidneys by depriving them of water needed for diuresis. In this regard it should not be forgotten that it is less work for the kidneys to secrete a larger volume of dilute urine than a small volume of highly concentrated urine. It is sound physiologic therapy to reduce the functional burden of injured structures as much as is feasible. An evaluation of the renal functional capacity with a recheck every six months is desirable. The renal concentration test is probably the most sensitive index of early depreciation in functional reserves. The urea concentration test, though less valuable in the milder instances of renal injury, should be included also, for it yields quantitative results which can be readily contrasted as tests are repeated. Repeated observation of the condition of the blood is important in any patient with nephritis; effective repair of injured tissues cannot be expected if they do not receive adequate oxygen because of an anemia. Even relatively minor degrees of anemia are significant. Such factors are probably more important than climate in the prophylaxis of chronic nephritis.

MYALGIA AND ALTITUDE

To the Editor:—**In the New York *Post* Charles Van Devander in his column "Washington Memo" tells about many of the delegates to the Inter-American conference in Mexico City being ill with what he says is known as mountain sickness for want of a better name. I was particularly interested in one of the symptoms of this illness noted by this writer, namely an ache in the limbs, and I was attracted by his explanation that it is due to the high altitude of Mexico City and the consequent decrease of oxygen content of the air. If this explanation is correct, this so-called mountain sickness would be a concrete illustration to substantiate the thesis that anoxia is one cause for myalgia. If this is so, fliers at high altitudes should experience pain in their limbs. Do people not accustomed to high altitudes suffer muscle pains when suddenly brought into rarefied atmospheres? Is the concept of anoxia as the cause of myalgias at high altitudes correct? Are there references to this problem? If anoxia resulting from decrease in oxygen content of the air may produce myalgias, then cannot anoxia due to other causes, especially disturbances in physiology, cause myalgias in people living at sea level? My interest is mainly with the last query, and it is this which attracted my attention to Van Devander's discussion on mountain sickness. If it is true that high altitudes cause anoxia and that this in turn causes muscle pains, is it proper to reason that muscle pains in people living in low altitudes may also be caused by an anoxia? May anoxia be one explanation for myalgias in these people? Is there positive scientific proof of the latter, assuming, of course, that such a thesis is tenable in the first place?**

Harry Weiner, M.D., Brooklyn.

ANSWER.—This inquiry boils down to a search for opinion as to a common cause for the myalgias seen at ordinary altitudes and for aching limbs as described in visitors recently arrived at Mexico City (7,500 feet above sea level). There is abundant literature in standard textbooks of physiology, such as Best and Taylor or Macleod, indexed under mountain sickness. However, the lowest level given for this complaint is 10,000 feet, and among the many symptoms listed aching limbs and pain are not included. For a better consideration of pain which is more satisfying to the mind than is the usual discourse on myalgia the recent textbook by Sir Thomas Lewis entitled Pain (New York, Macmillan Company, 1942) is suggested. There, in a somewhat philosophic discussion of muscle pain, a distinction is made between muscle ischemia, which is regional and may cause pain, and anoxemia, which is general and causes brain and heart symptoms but not myalgia. Fliers at high altitudes do have pain in the limbs. Pain in that instance is caused by lowered barometric pressure and not by anoxia. This fact has been proved in many chamber "flights" by experimental teams and by the air corps in trainees in similar manner. Aviators' bends never occur at 7,500 feet and seldom if ever below 20,000 feet. If myalgia is caused by anoxia the mechanism must be impaired blood flow to the individual muscle and not deficient respiration.

CONTINUED FEVER FOLLOWING SCARLET FEVER

To the Editor:—**I should like your opinion as to the necessity of enforcing bed rest for scarlet fever patients after they have apparently made a good recovery except for a fluctuating temperature from 98.6 to 99.6 F. During the past winter I have had several scarlet fever patients who, months after the original condition has cleared, continue to have a slight fever. In none was there involvement of the lymphatics, ears, kidneys or heart, yet their sedimentation rates were about twice the normal rate.**

Joseph P. Griffin, M.D., Chesterton, Ind.

ANSWER.—With the mild type of scarlet fever which now generally prevails, enforced bed rest of ten days is sufficient if there are no complications. In some contagious disease hospitals the minimum requirement of enforced bed rest is fourteen days from the onset of the illness. However, it is best to confine patients with elevated temperatures to their beds regardless of the duration of the disease. Often, if there is a rise in the erythrocyte sedimentation rate about the fourteenth day of scarlet fever, it is assumed that some complication is present or will develop. In patients in whom there is not any involvement of the lymphatics, ears, kidneys or heart, a sinusitis should be suspected if the throat, including the tonsils, is negative.

ALOPECIA

To the Editor:—**What are the prognosis and effective therapy, if any, for alopecia of the head, eyebrows and eyelashes which has gradually become complete during the past year in a normal 17 year old boy. He has normal distribution of the axillary and pubic hair.**

George D. Burns, M.D., Derby, Conn.

ANSWER.—This is undoubtedly a case of alopecia areata, which from the description may go on to that known as alopecia totalis. The prognosis depends chiefly on the amount of hair loss and the age. If the alopecia is partial, the prognosis is, of course, much better and roughly parallels the amount. The youth of the patient tends to make the prognosis more favorable. As far as is known, the distribution of hair dependent on sex has nothing to do with alopecia areata.

There are many forms of treatment. X-rays to the scalp short of producing an erythema are said to be effective; these should be given by an expert, of course, because of the hazard of producing a permanent alopecia due to overdosage. Filtered x-rays may be used to the cervical spinal cord. Ultraviolet ray therapy is one of the most effective methods; it should be used in graduated doses, and some attempt should be made at using stimulating quantities. Recommended agents for local application to the scalp are both numerous and varied, but in general they have irritant properties. One is liquefied phenol, which is quickly neutralized by alcohol as soon as the treated area develops a parboiled appearance. Another popular agent is Cutler's fluid, which consists of equal parts of tincture of iodine, phenol and chloral hydrate. This is applied to all the parts and repeated on the average of once a week, or as soon as the irritation subsides. It is probable that this disease tends to run a course which in most cases is self limited. In the malignant variety the hair continues to fall until a total alopecia results, and this is permanent. In total alopecia the loss of hair may not be total, although some alopecia remains permanently.

MULTIPLE IMMUNIZATION DURING PREGNANCY

To the Editor:—**A woman aged 27, due to be delivered in December, plans to fly to a destination outside the country to rejoin her husband. This is the first pregnancy and her condition is excellent. Before her passports will be issued she is required to have all immunization inoculations including that for typhus. Are there any untoward sequelae to be anticipated? Are any special precautions to be observed?**

John M. Higgins, M.D., Sayre, Pa.

ANSWER.—No untoward sequelae are to be anticipated from immunization inoculations, including typhus, given during pregnancy. No special precautions need be observed in giving these inoculations.